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THE LOCAL TREATMENT OF THE REGIONAL FORMS OF ECZEMA.

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In the present article the remarks made will be confined to the local treatment of eczema. It is presupposed that the reader is familiar with the commoner manifestations of this disease, and that, moreover, its general pathology is understood, at least so far as it possesses a bearing upon therapeutics. Eczema is a name given to a disease of the skin which has a tolerably clear boundary, notwithstanding the fact that its manifestations are varied and are capable of undergoing numerous modifications. The fact remains, however, notwithstanding this statement, that the disease is pretty sharply defined. Thus the writer, in his several works on the diseases of the skin, has been in the habit of considering the definition of eczema mainly from a clinical standpoint, its prominent objective and subjective symptoms being thus brought forward conspicuously. It may be remarked here at the outset that I do not believe it possible for a practitioner of medicine to treat the disease successfully unless he possesses some knowledge of its general and local pathology. He must understand the process as a whole and be familiar with the pathological changes that are taking place in the skin if the remedies for its cure are to be wisely and judiciously selected. To some it may seem that the treatment of the disease is at best haphazard, and that even an experienced dermatologist may err in the selection of the remedies for a given case as readily as the all-around physician. There are points, however, which appear at once to the experienced observer in the local as well as in the general pathology of the disease. A recognition of these will enable him to lay out a

course of treatment which, because of his practical experience with many other similar cases, will probably prove beneficial.

There are two distinct modes of therapeutics: one of these calls for internal remedies, together with suitable diet; the other for local agents, including baths, lotions, ointments, pastes, plasters, bandages, instruments, and other mechanical appliances. I desire to say here that both methods are of great value in the management and treatment of this disease, and that not infrequently both are required to effect a cure. I have much faith in the proper employment of internal therapeutics in suitable cases. There are many cases of relapsing and chronic eczema which it is almost impossible to cure without the aid of drugs, diet, and hygiene, and I desire to emphasize my views on this point in connection with the remarks about to be made on local treatment. All cases of eczema, however, do not require internal therapeutics; there are some in which local remedies are all-sufficient effectually to cure the disease. In the employment of the latter much depends not only on the variety and form of the disease of the skin present, but also on the remedy prescribed, its strength, and, not least in importance, its mode of application—that is, whether in the form of an ointment, a paste, a plaster, or a lotion. The mode of application of the drugs useful in eczema and in other diseases of the skin is, in general, a more important matter than the general practitioner not familiar with the skin and its diseases is perhaps aware of. Not infrequently it means either an amelioration or an aggravation of the symptoms, according as one or another mode of treatment is made use of. Thus, pastes are often useful in cases in which ointments with friction are not tolerated, and every physician of experience is well aware that lotions may often be used with good results in cases in which ointments or pastes are not well borne.

In the present article it is my purpose to direct attention to the local treatment of eczema only, and I shall confine my remarks particularly to the management of the so-called regional forms of the disease, some of which require special formulæ and methods of application. It will be understood, then, that by pointing out and dwelling upon the most useful local remedies at our command for the commoner regional forms of the disease, I by no means wish to ignore or slight the great value of appropriate internal therapy in suitable cases. Local treatment in eczema, however, is of such importance that the subject is worthy of the most attentive consideration and study. In no other inflammatory disease of the skin is it so valuable and important. Inasmuch as we find in practice that cases of eczema usually present themselves with manifestations of the disease upon one or another locality, as, for example, the scalp, face, hand, or leg, as the case may be, the subject of the local treatment may be properly and satisfactorily considered from the point of view of the region invaded. It is the most practical

way to discuss the subject. It will be found that, according to the minute anatomy of the skin, most regions call for somewhat different remedies and methods of application. In a general way it may be stated that it is altogether inadequate to say, for example, that such drugs as tar, the mercurial salts, salicylic acid, carbolic acid, zinc oxide, and the like, are useful in eczema, without further stating the regions involved, the existing variety of the disease, and the stages of the pathological process present, especially whether acute, subacute, or chronic. All these have a most important bearing on the selection of local remedies, their method of employment, and their dosage.

The fact need not be dwelt upon that eczema may manifest itself upon any part of the general surface of the body, no region being exempt, and that the mucous membrane as well as the skin may be invaded. The mucous membrane, however, suffers by comparison infrequently, the process disposing markedly to attack the skin only. While eczema may invade large and extensive areas of the skin or even the entire general cutaneous surface, as happens occasionally, the tendency is for it to appear in small rather than large areas, as, for example, upon the arms, legs, hands, flexures, or scalp. The patches of the disease, usually irregular in shape, are often small, especially in the beginning; but the tendency is to spread on the periphery or in the form of outlying foci, which are peculiar in showing a marked disposition to coalesce, and it is in this way that large patches are generally formed.

It is well known that eczema tends to manifest itself in certain particular regions, and that it occurs here in more or less constant clinical varieties; thus, in adults the face is a favorite locality for the erythematous variety, the hands for the erythemato-squamous and fissured variety, the leg for the chronic, infiltrated, moist, and crusted variety (eczema madidans), and so on.

With these few general observations on the disease and its regional forms, the subject of the treatment may be entered upon. In order to discuss the matter to advantage I shall consider each of the more important regional forms of the disease systematically. At this point I would ask the reader to remember that whatever the region involved may be the disease is always the same, modified more or less by the anatomy of the skin, the age, and the general condition of the subject, and by local causes of one kind or another, as microbic infections, scratching, and irritants. The latter factors play a very important part in the evolution of the disease, much more so than was supposed a decade ago. Even today, knowing, as we do, so much more about bacteriology than we did a few years ago, they are hardly appreciated, if we may judge by the teachings of some of the more recent works on diseases of the skin.

Eczema of the Scalp. When the disease attacks this region in

adults it is frequently erythemato-squamous or distinctly squamous in variety. In infants and children, however, it is more apt to be pustular and crusted. It tends in either event to assume a chronic course, hence stimulating remedies are usually demanded. It is liable, especially in adults, to be confounded with psoriasis and seborrhœa, and in children with tinea tonsurans. In the latter case the microscope alone may be able to determine the question, for the hairs are by no means always loose and to be readily extracted in tinea tonsurans. This is true particularly of the disseminate, chronic form of ringworm of the scalp. If the variety of eczema present be vesico-pustular or pustular, as so often is the case in infants and children, the crusts are to be at once removed by a bland oil, followed by soap and water, applied repeatedly until the part is free from crusts. In these cases a weak carbolic-acid lotion, together with a saturated solution of boric acid and ten minims of glycerin to the ounce, followed by an ointment of salicylic acid, fifteen grains to the ounce, will often prove useful. In acute pustular eczema, especially in relapsing cases, ichthyol in olive oil, ten or twenty grains to the ounce, or the same drug with equal parts of almond oil and lime-water, is useful. Such cases usually demand mild and soothing applications. In the subacute vesicular or discharging form a salicylic-acid ointment, twenty-five to forty grains to the ounce, often has the effect of speedily checking the secretion and of curing the disease. Sometimes a weak sulphur ointment, ten to thirty grains to the ounce, especially in children where crusting exists, proves useful, and in adults in those cases in which the sebaceous glands are involved, constituting so-called seborrhœic eczema. In the mildest manifestations of the disease, especially when of the squamous variety, medicated soaps, as those containing sulphur, salicylic-sulphur, resorcin, and tar, may be of service; but for ordinary cases they are not efficacious. They lack penetrating power.

In adults the disease occurs usually in the form of one or several coin-sized, chronic, more or less infiltrated, reddish, scaly, diffuse, or circumscribed areas, the amount of scaling being sometimes slight. The itching being in most cases marked, the scales are scratched off, and the patch is thus kept comparatively free from scales or is excoriated or moist. Tar and the tarry products, in the form of lotions or ointment, are especially useful in this form of eczema, but the preparations should not be prescribed too strong. It is a common mistake to use tar too strong, thus overstimulating the cutaneous capillaries, with the result that the skin is irritated rather than soothed. The compound tincture of mineral tar (the formula for which has been recently published in this JOURNAL and also in Part I. of the writer's work on *Cutaneous Medicine*) is an excellent preparation for the employment of tar in a liquid form. It should in almost all cases be prescribed weak rather than strong, say from three to fifteen or twenty minims to the ounce of

water, to which a few minims of glycerin may generally be added with advantage. The lotion should be sponged on or gently rubbed into the affected areas several times daily. The same preparation of coal-tar may be prescribed in the form of an ointment, with cold-cream ointment or petrolatum as a base. In some cases pix liquida, especially in ointment-form, is more useful; and here, again, I would speak of the advantage to be gained by not prescribing the tar too strong. A weak preparation is often beneficial in eczema, whereas a strong one may prove overstimulating. Fifteen minims or a half-drachm of oil of birch (oleum rusci), preferably the crude oil, or of oil of cade, to the ounce of oil of sweet almond or olive oil, may be mentioned as useful; and where a decidedly stimulating effect is desired, as in stubborn patches of long standing, a mixture of equal parts of oil of cade, soft soap, and alcohol may be rubbed in or painted on lightly twice a day. Oil of cade in alcohol or ether is sometimes preferable. Creolin is a remedy that may be used in the form of a lotion instead of the compound tincture of mineral tar, and in about the same strength. Of the mercurial salts, often so useful in eczema in general, calomel and white precipitate, in the form of ointment, twenty to eighty grains to the ounce, are to be especially recommended, and particularly in those cases in which the tarry preparations are not tolerated; and citrine ointment (always freshly prepared), rubbed down with olive oil or oil of almond to the consistence of thick cream, is in chronic cases distinctly serviceable. A tannic-acid ointment, a half-drachm or a drachm to the ounce, with carbolic acid, ten or fifteen grains, is sometimes useful in cases in which other remedies have failed; and in obstinate cases of moist eczema applications of a solution of silver nitrate from 1 to 5 per cent. strength, daily or every three days, followed by a mildly stimulating ointment, as of salicylic acid, ten or fifteen grains to the ounce, may prove beneficial.

Whatever the drug or the preparation employed may be, the case should be watched in order to note the result, especially as to the degree of stimulation produced. It is far better practice to begin with weak preparations and gradually to increase their strength, if the skin will bear them, than to order a strong preparation at first; for if the latter is not acceptable to the skin, it will probably excite and aggravate the disease, and will cause it to spread. Much mischief may thus be done in a very short period. The physician should always keep in mind when prescribing for eczema, whether of the scalp or of other regions, and whether the disease be acute or chronic, that, above all, the remedies should be so prescribed that the least amount of harm can occur. By injudicious treatment it is a very easy matter to aggravate eczema; hence due caution should always be exercised in using drugs, especially in the acute and subacute forms, in which the process is active and uncertain in its course.

Eczema of the Face. This region is frequently the seat of the disease, both in an acute and in a chronic form, due to the facts, I believe, that the skin here is highly vascular, and that the vasomotor system is in the closest touch with the locality. Reflex cutaneous diseases of all kinds, especially those connected with the alimentary tract, are particularly prone to manifest themselves on the face, as seen in acne as well as in eczema. In adults the erythemato-vesicular and erythematous varieties of eczema are those most often met with on the face. The former is often acute or subacute, whereas the latter is usually chronic and is rebellious to local remedies. Boric acid and carbolic acid in the form of a lotion, ten to fifteen grains to the ounce, with a similar amount of glycerin, with or without the addition of zinc oxide, are both particularly useful in the chronic erythematous variety observed so frequently upon the forehead in middle-aged or elderly persons. The former is the safer remedy of the two, and must be regarded as of distinct value. It acts in some cases very happily, especially where the lesion is superficial. In eczema of the forehead there is generally considerable thickening of the skin, the natural folds and lines being exaggerated. Camphor in this form of the disease sometimes acts well, as in the following ointment, which I have found a good formula, especially useful where there is hyperæsthesia as well as itching: ℞.—Camphor, ʒss; emplast. plumbii, ʒiij; petrolati, ʒiij; ol. olivæ, ʒj. The amount of camphor may be decreased should it cause burning sensations. An ointment composed of acetanilid and cold-cream ointment, from forty to eighty grains to the ounce, often serves to allay the heat and itching, which are generally such marked symptoms. Acetanilid possesses slight anæsthetic and cooling properties when applied to the skin. I may refer to two other formulæ which are not as yet widely known, both being cooling and usually acceptable in this form of the disease. The first is composed of tragacanth, 5 parts; glycerin, 2 parts; boiling water, 93 parts, to which are added 2 parts of boric acid to preserve it. This formula gives a thin mucilaginous mixture or jelly, which dries rapidly on the skin, imparting to it a cooling sensation. Zinc oxide, about twenty grains to the ounce, and such drugs as carbolic acid, ichthyol, boric acid, and the like, may be added to it with advantage. It possesses the advantages of forming a thin, pliable varnish, which protects the skin and excludes the air, and, morever, of being soluble in water, and hence may be readily removed by washing. This formula was originally put forth by Prof. Pick, the addition of the boric acid (to preserve the mucilage) being the writer's slight modification. The other cooling, somewhat astringent lotion referred to is made with powdered talc and starch, of each 100 parts; glycerin, 40 parts; lead-water, 100 parts. This is to be diluted with from two to four parts of water. It is usually cooling in its im-

mediate effect, and is particularly useful in dry, irritable, and itching eczema. As a rule, it is not well borne where there is moisture or discharge, in these cases a zinc-oxide lotion without lead-water and one containing much less glycerin or none being preferable. The formula was first published by Prof. C. Bœck, of Christiania. Stimulating ointments are not, as a rule, tolerated in erythematous eczema, but the milder pastes may often be prescribed with benefit. The vesicular, vesico-pustular, and pustular eczemas of infants and children, so frequently met with on the face, especially on the cheeks (those areas which are such well-known centres of flushing and of congestion, due to varied causes acting reflexly), call for a somewhat different line of treatment, because they are more varied in their manifestation and more liable to rapid changes, being better and worse from day to day or week to week. In these cases the simpler drying lotions, as of zinc oxide and lime-water, two drachms to four ounces, with the addition of a little glycerin; boric-acid lotions, without or with such powders as starch, talc, zinc oxide, or bismuth subnitrate; and dusting-powders, may be advantageously made use of. The bland pastes, such as the following (known as Lassar's formula), are also of great value: R.—Zinc oxide, ʒij; pulv. amyli, ʒij; petrolatum, ʒiv. To this may be added powdered camphor, ten or twenty grains; salicylic acid, ten or fifteen grains; carbolic acid or resorcin, ten grains. All are valuable formulæ in common use. Pastes of this kind, of which the formula for the simple paste just given may be accepted as a good base, suitable for eczema generally upon any region that is not hairy, have to a large extent superseded zinc oxide and other similar ointments. They dry gradually upon the skin, but are not too drying; protect the surface from the air; allay itching and burning; prevent excoriations, and in this way, apart from any active drug they may contain, serve as valuable therapeutic agents. They are the means of bringing into close and prolonged contact with the skin many drugs, and thus prove additionally serviceable. In patchy eczemas of the arms, forearms, thighs, legs, and of the trunk, I find them particularly useful.

Eczema of the Lips. The muco-cutaneous surface about the mouth is sometimes the seat of rebellious eczema, both lips being in most cases invaded, the disease being usually confined to this locality. The symptoms are swelling, redness, heat, but not much itching, and oozing of serous or puriform fluid, with crusting. In other cases scaling, often with fissures, is a more prominent symptom. The diagnosis is usually not difficult; but syphilis, herpes simplex, and cheilitis grandularis aposthematosa must be excluded, the latter disease in particular resembling eczema closely. The involvement of the mucoid glands, with their patulous orifices, discharging a yellowish secretion which crusts readily and adheres to the lip tenaciously, will in most cases serve to render the

diagnosis tolerably easy. The treatment of chronic eczema of this region is attended with obvious difficulties. It will be found that the disease occurring here is benefited either by such soothing and bland remedies as boric-acid and glycerin lotions or by such strong agents as solutions of potassa or nitrate of silver applied occasionally. The latter are at times distinctly beneficial in chronic cases. Internal treatment and hygiene are not to be neglected.

Eczema of the Eyelids. From my clinical observation I do not hesitate to state that many cases of so-called blepharitis and of blepharo-conjunctivitis are eczematous. Such cases are often eczema, usually involving the hair-follicles, and should be treated as this disease, both locally and, also, in most cases, internally. Often, especially in adults, other signs of eczema, more or less pronounced, exist elsewhere, when the diagnosis is readily made. This form of eczema occurs most frequently in children, especially in those of a weakly or a distinctly scrofulous disposition, so that much is to be hoped for by the proper use of hygiene and diet, including good food, milk, cream, butter, eggs, cod-liver oil, and, where indicated, a change of climate. Locally, asepsis is to be insisted on, the conjunctivæ as well as the lids being treated with a weak corrosive-sublimate solution (at first 1 : 10,000 and later stronger). The skin surrounding the eyelids should at the same time be similarly treated. Here, as in eczema of the lids, potassa solution (ten grains to the ounce of water) and silver nitrate solution are useful, to be carefully applied either after extraction of the eyelashes or without resorting to this procedure. The application of potassa solutions should in all cases be performed with care after everting and drying the lid, an acid being afterward employed to neutralize the alkali. A simple, non-irritating, good ophthalmic ointment consists of lanolin, ʒiij; oil of sweet almond and water, of each ʒss. I have found it an acceptable ointment for the eyelids, and can indorse what Jamieson, of Edinburgh, has said in its favor.

Eczema of the Beard. In males the bearded portion of the face is occasionally affected, the hair-follicles, as in eczema of the eyelids, being the main seat of the disease; but in my experience the hair-follicles are not prone to be invaded by the eczematous process, so that I think eczema folliculare must be looked upon as a somewhat uncommon manifestation. A distinction should be made between an eczematous inflammation of the follicles and the varied forms of folliculitis in which the signs of eczema are wanting. In the diagnosis, sycosis vulgaris and tinea sycosis are, of course, also to be excluded. The local treatment is mainly that generally employed in sycosis, although the skin will be found less tolerant of stimulating remedies than in that disease.

Antiseptic lotions, pastes, ointments, and plasters are all useful, especially those containing the mercurials and sulphur. Neither should be

used strong. Ointments and pastes containing ichthyol are serviceable, and sometimes they may be used with benefit in 10 or 15 per cent. strength, though considerably weaker strengths are usually more useful. Salicylic-acid plasters, from 2 to 5 per cent. strength, often prove valuable in circumscribed areas of the disease. They should be worn by day as well as by night when practicable, shaving being performed every other day. The formula for plasters of this kind will be given later in connection with eczema of the leg, in which they prove especially valuable.

Eczema of the Ears. The auricles and the external auditory canal are both liable to be invaded by eczema, but less so than the face. On account of the peculiar anatomy of the auricle and the tumefaction which usually characterizes eczema of this region, the local treatment is beset with difficulties. Here ointments and pastes are of more service than lotions or plasters. The vesicular and pustular varieties are those which most frequently attack the auricles, but the squamous variety is also met with here, and has a special predilection for the meatus and the external auditory canal. After the acute vesicular or pustular symptoms have been subdued by zinc-oxide and boric-acid lotions or by solution of hydrogen dioxide (3 per cent.), and the crusts at the same time removed, a zinc-starch-petrolatum paste, with carbolic acid or salicylic acid (2 or 3 per cent. strength, or with tar or acetanilid, 5 or 10 per cent. strength) may be prescribed. In other cases a calomel ointment, twenty to sixty grains to the ounce, rubbed in, to which tar (half a drachm to the ounce) may often be added with advantage, is more useful than the pastes mentioned. Tar is generally well tolerated about the auricle and also in the canal, especially in ointment-form, and usually it may be prescribed stronger here than in most other regions. Where fissures exist, especially in the sulcus back of the auricle or elsewhere, touching them occasionally with a strong solution of silver nitrate may prove distinctly useful.

Eczema of the Trunk, Thighs, and Arms. These regional forms may be considered together, for the reason that the disease usually manifests itself with the same lesions upon the thighs and arms as upon the trunk. The eruption is apt to be symmetrical and diffuse, and to assume the form of erythema, papules, or vesico-papules. The diffuse or punctiform erythematous, the maculo-papular, and the papular varieties are much commoner on the trunk than on any other region. The back, the hips, and the thighs are favorite seats for papular eczema. Ill-defined lesions are more frequently met with on the trunk than elsewhere, and the diagnosis is accordingly more difficult, although the existence of multiformity is in itself a helpful feature. The erythematous and maculo-papular varieties, which are in almost all cases either acute or subacute, call for bland or sedative powders, washes, or pastes, as, for

example, a zinc-oxide and glycerin wash, with or without carbolic acid, a boric-acid lotion, or a zinc-starch-petrolatum paste. In these cases care should be taken not to employ stimulating remedies, which are tolerably sure to aggravate the condition. In the strictly papular variety, on the other hand, in which the lesions are discrete or exist in small patches, the papules being the size of pin-heads, moderately stimulating washes, as of carbolic acid and glycerin, compound tincture of coal-tar, diluted black-wash, thymol, camphor, or salicylic-acid paste, and other antipruritic remedies, in wash or in paste form, may be used. It should be borne in mind that the formulæ should be weak, and that in no instance should burning sensations be caused by the applications. A lotion composed of zinc oxide, ʒij; boric acid, ʒj; glycerin, ʒj; water, ℥vj, will generally be found serviceable in the acute, diffuse erythematous variety. To this lotion ten grains of carbolic acid or five minims of tincture of coal-tar to the ounce may be added with benefit, while in the papular variety the strength may be increased. The camphor or salicylic-acid pastes may be made in the strength of ten or fifteen grains to the ounce. A weak camphor dusting-powder, ten grains to the ounce, is sometimes beneficial in the punctiform erythematous or papular lesions met with especially on the trunk. That indicated for the trunk is equally applicable to the thighs and arms. Below the knee and elbows the lesions are generally different in form, showing less tendency to become diffuse, and stronger formulæ are indicated.

In the axilla and on the border of this region an erythemato-vesicular eruption, often circumscribed, with crusting or scaling, is not infrequently met with, and the same varieties of the disease are prone to occur beneath the mammæ in females, in the groin, and on the flexor surface of the thigh near the genital and anal regions. The disease in the latter regions may simulate tinea circinata, due to the trichophyton fungus, in which case the microscope should be employed as an aid in the diagnosis. Bland or soothing, slightly astringent dusting-powders, lotions, and pastes are useful in this form of the disease, a tannic acid or a weak sulphur paste (fifteen or twenty grains to the ounce) being serviceable. It is in these localities, as well as on the scalp, chest, and back, that seborrhœic eczema is generally met with.

Eczema of the Genitals. In the male the scrotum is the locality usually invaded, the penis frequently escaping. In the female the labia majora are commonly the seat of the disease, the neighboring skin being also frequently invaded. Eczema of the scrotum is generally particularly rebellious to treatment. In chronic cases strong remedies are demanded. The acute form needs no special remarks as to treatment, for the reason that the disease seldom begins acutely, but, as a rule, insidiously, increasing in severity and spreading gradually, especially

when the erythematous and moist varieties exist. In eczema of the genitalia, particularly the penis and vulva, glycosuria should be suspected and the urine examined. Pruritus should also be excluded. In practice I find that physicians not infrequently confound eczema with pruritus vulvæ, the error doubtless arising because the skin has not been properly examined. In one case there is no inflammation, merely the existence of subjective symptoms; in the other there are signs of eczema, often erythematous or erythemato-squamous in character. In chronic, obstinate eczema of the scrotum, attended with much thickening and corrugation of the skin, scaling, or crusting, strong applications are generally demanded. Tar, from a half to one drachm to the ounce of ointment; tar ointment, one ounce, calomel, one drachm, and carbolic acid, fifteen minims; and acetanilid, one drachm to the ounce of cold-cream ointment, are all serviceable formulæ, to be rubbed in gently but firmly three or four times daily for ten or fifteen minutes each time they are applied. The compound tincture of mineral tar, diluted (to the extent that a sensation of warmth is imparted to the skin); Vleminckx's solution (of sulphuretted lime), one part to six or three of water, or in some cases even pure, used as a lotion three or four times daily, followed by an ointment or a paste, are both valuable. In other cases painting the skin with a solution of potassa, ten or twenty grains to the ounce, once daily, employing it long enough and strong enough to cause a slightly denuded surface, or rubbing the skin freely with sapo mollis, followed in either case by a soothing litharge paste or ointment, may be found useful. The skin of the scrotum tolerates what seems like harsh treatment better than that of most other regions, so that the various stronger remedies employed in chronic eczema gènerally may often be used here with advantage. Tincture of soft-soap, oil of cade, and alcohol; strong carbolic acid and silver nitrate solutions; tincture of iodine; 10 per cent. solution of hydrogen dioxide, all employed occasionally, followed by the use of emollient ointments and pastes or dusting-powders, may be mentioned as being of value in rebellious cases. These remedies may also be employed in chronic eczema of the vulva, with a thickened state of the skin, but they must be used much weaker than upon the scrotum. The object in view in applying strong remedies like those just referred to is to make a positive impression upon the integument by exciting a certain degree of acute inflammation and then counteracting it with soothing and protective applications in the form of pastes or ointments. I have known equal parts of calomel and starch used as a dusting-powder to afford relief in obstinate cases of erythematous eczema of the scrotum.

Eczema of the genitals is often a distinct manifestation of a neurotic state, and hence demands a course of diet and hygiene, and suitable internal remedies; and until defective assimilation, nutrition, and in-

nervation are remedied by such means, local treatment may prove ineffectual.

Eczema of the Anus. The diagnosis between eczema and pruritus of this region should be clearly made out before beginning active local treatment. As a rule, this is not difficult. Inspection of the region should be insisted on. The presence or absence of hemorrhoids, external or internal, and the state of the muco-cutaneous surface as to œdema, excoriations, or fissures should at the same time be ascertained. I need scarcely refer to the importance of noting the condition of the alimentary canal and of the bowels in particular. There are cases in which the simpler applications, as of carbolic acid and petrolatum, ten or fifteen grains to the ounce, or a calomel ointment, suffice to afford relief; but most cases require other and more active remedies. I do not think, judging from my experience, that the value of very hot-water applications to the anus, followed by cooling or antipruritic ointments or lotions, is as well known as it ought to be. By this simple application, used for ten or twenty minutes, relief is often obtained in cases that have resisted a long list of more heroic remedies. In several desperate cases I have obtained much ease from the distressing itching and burning sensations by the use of the following ointment: ℞.—Precipitated sulphur, ℈ij; naphthol, ℈j; morphine, gr. ij; zinc carbonate, ʒj; cold-cream ointment, ℥j.

In prescribing ointments the base employed sometimes makes a distinct difference to the skin; thus in some persons the petrolatum ointments invariably prove heating or irritating, while the vegetable or animal oils and fats are soothing. Cold-cream ointment constitutes an excellent base for many ointments, its virtue being to some extent due to the water it contains, which by evaporation is cooling. Lanolin ointments and creams, for the same reason, act similarly, and hence are often made use of in cases where a refrigerant effect is desired. In rebellious eczema of the anus, with thickening of the skin, strong solutions of tincture of coal-tar, carbolic acid, potassa, silver nitrate, tincture of iodine, and scarifications and multiple punctures, may all be resorted to, and sometimes with great benefit. There is no doubt in my mind that almost all cases of chronic eczema of the anus (and there are many such in large communities of people) are curable by resorting to the treatment, internal, general, and local, adapted to their particular needs. I make this statement because so many persons afflicted with this form of the disease have from time to time applied to me for advice, firm in their belief that nothing in the way of permanent cure was to be hoped for. I am of the opinion, moreover, that practically all cases of localized eczema are curable. There are doubtless some exceptions, but I do not believe that they are numerous. Because such cases (and others as well) do not improve or recover under the use of this or that

ointment or lotion, which perhaps has been recommended to them as infallible or as having cured many similar cases, these persons gradually, through a varied experience, arrive at the conclusion that their particular case is hopeless—not, however, until they have become exhausted mentally, morally, and physically in the effort to obtain rest and freedom from their tormenting enemy.

Eczema of the Nipples. Occasionally examples of chronic eczema of the nipples in women who have not borne children are met with, the disease occurring in these cases either on one or on both nipples. In some of the most rebellious cases that I have seen one nipple only was invaded. When the disease has become well intrenched, is circumscribed about the nipple and areola, with thickening of the skin, fissures, and crusting, strong applications are required; and it is often a matter of surprise to observe the vigorous and apparently harsh treatment tolerated by this region. Frictions with sapo mollis, painting with liquor potassæ, acetic or lactic acid, silver nitrate, tincture of iodine, all followed by emollient applications, ointments (like diachylon), pastes, or plasters, are not only generally well borne, but are of much value. The cases that I have in mind are almost always stubborn and difficult to influence by the ordinary methods of treating eczema, and for this reason the stronger remedies may as well be employed first as last, thus terminating the disease as soon as possible.

In connection with eczema occurring upon the nipple and areola, especially in the female, mention may be made of Paget's disease of the nipple, which usually has its seat here, although it may (as Crocker and others have shown) occur also in other regions, as the scrotum and face. As is now generally known, it begins as an eczematoid disease, at first in most instances indistinguishable from fissured eczema or circumscribed eczema rubrum, and running a chronic course passes into a cancerous disease of the skin, with involvement eventually, in most cases, of the mammary gland, with the usual signs of duct or glandular cancer. In the beginning the microscope as well as the clinical signs show the disease to be a malignant inflammation of the papillary layer of the skin, with destruction of its connective tissue, as was first pointed out by Thin, of London. It may be distinguished clinically from common eczema of the nipple and areola by a well-defined border, with distinct evidences of a more or less dense, cellular infiltration when the patch is taken between the fingers. The cases that I have observed have all been very rebellious to treatment, and this is also the experience of others. If the process has not advanced deeply, the best method of treatment consists of scraping the diseased skin with a dermal curette, and then applying the following plaster: ℞.—Pyrogallol, ʒij; resorcin, ʒij; salicylic acid, ʒij; soap plaster, ʒiij; olive oil, ʒss. This is to be spread upon muslin or kid, and the dressing reapplied twice daily. At

the end of from one to three weeks, according to its action and the character of the wound, it is to be replaced by a 2 per cent. resorcin plaster, under which, unless the ducts are invaded, it ought to heal satisfactorily. The disease when fully developed is an eczematoid epithelioma, and for the reason that it begins insidiously and is looked upon as a peculiar form of eczema of the nipple or areola, stubbornly rebellious to treatment, its true nature is not suspected until the process is deeply seated in the skin or until the ducts of the mammary gland are invaded. Such, at least, has been my experience. I believe that if the disease is properly treated by vigorous measures, such as indicated, in the early stage, it can generally be cured without resorting to a radical operation.

Eczema of the Leg. The disease occurring here manifests itself in the form of the erythematous, erythemato-squamous, vesicular, or vesico-pustular varieties, all evincing a tendency to pass into superficial or deep-seated eczema madidans or rubrum, with more or less crusting. All eczemas of the leg, however, are by no means examples of eczema rubrum. The variety of the disease which may appear in this region will depend on the age and the general condition of the subject, the degree of venous engorgement, stasis, and œdema, and the general strength or debility of the cutaneous tissues. Scratching and local infection from without always play a conspicuous part in this form of eczema. As a rule, the skin becomes diseased either in the form of one or of more coin- or palm-sized, reddened, dry and scaly, or moist or discharging areas, which run a chronic course and tend to coalesce, thus forming larger patches. The treatment naturally depends on the variety and the stage of the disease present, and also whether complications, as varix, œdema of the subcutaneous tissue, or ulcers exist. The milder forms of erythematous, slightly scaly patches call for no special remark as regards treatment, they being usually amenable to the well-known ointments and pastes in every-day use, and already referred to. In cases in which the process is acute and the surface weeping, the employment of black-wash, used as a lotion freely, followed by zinc-oxide ointment, will often afford much relief. I have made use of this simple method of treatment for a great many years, and in suitable cases it seldom fails to advance the state of the skin considerably toward recovery or cure. It is eminently adapted to acute weeping eczemas. Keeping the ointment close to the limb, and proper bandaging are, of course, important. The usual method of rubbing into the skin a stimulating ointment, as practised from time immemorial, may prove beneficial or curative, but there are many better and more expeditious modes of treatment. The employment of plasters is a comparatively recent, distinct improvement over inunction with ointments in the treatment of chronic eczema of the leg, whether the patch be dry or wet. The dressing entails comparatively little trouble, and in suitable cases insures not

only ease and comfort to the patient, but healing of the diseased areas. Plasters of this kind are made in various ways, and are composed of certain non-irritating bases to which the active expedient desired for the special case is added. Some plasters of this kind are manufactured already spread on muslin, according to a list of formulæ, and are both elegant and valuable preparations. Unna and Beiersdorf, of Hamburg, have been largely instrumental in perfecting the wholesale manufacture of these plasters as well as so-called ointment-muslins (*i.e.*, ointments spread by machinery on a suitable muslin fabric), both being useful in many forms of disease, not only in eczema, but also in numerous other instances in which oily plaster-dressings are required to be applied continuously; but, valuable as these elegant pharmaceutical preparations are, their employment must necessarily be more or less restricted to large cities, where the apothecaries' stock can be readily replenished. Other formulæ for similar plasters, which can be made at short notice by any competent apothecary, and can be spread on muslin or thin kid by the patient as needed, have been devised by Prof. Pick, of Prague, and in this country especially by Dr. Klotz, of New York, and by the writer. After a long series of experiments with different substances as plaster bases I have arrived at the conclusion that the following plaster can be recommended: ℞.—Liquefied soap plaster (U. S. P.), 90 parts; olive oil, 10 parts. This is a slight modification of Pick's original formulæ, over which it is an improvement as regards consistence. It is a moderately soft plaster, distinctly adhesive, and can be spread readily in ordinary living-room temperature. ℥ To this plaster base can be added salicylic acid, tar, carbolic acid, resorcin, sulphur, corrosive sublimate, chrysarobin, and many other drugs. Plasters of this kind are particularly useful in subacute and chronic, infiltrated patches of eczema, whether of the leg or of some other region. Chronic patches that have resisted other modes of treatment not infrequently yield to these plasters, which may be worn sometimes for several days without change. Of course, the stiffer the plaster the less frequently will there be necessity for changing the dressing. In regard to salicylic acid, my investigations, pharmaceutical and clinical, have proved that the greater the percentage of salicylic acid the softer the plaster becomes, so that less olive oil is required in the making of a plaster that is to contain 10 per cent. of salicylic acid than in one that is to contain 2 per cent. Allowance must therefore be made in writing the formula for the amount of salicylic acid.[1] In subacute eczemas of the leg a 2 per cent. salicylic-acid plaster is often valuable, allaying the itching, reducing the redness and thickening, and in improving generally the diseased

[1] The writer is much indebted to Mr. J. F. Baer, apothecary, 1400 Spruce Street, Philadelphia, for his aid in arriving at the best formula for these plasters.

condition. In chronic sluggish patches a 5 or 10 per cent. plaster may prove more useful. This method of treatment possesses many advantages over inunction with ointments, which require to be applied frequently, entailing the loss of considerable time and expense. No other method of treating patches of chronic eczema rubrum of the leg is so readily applied, cheap, and generally useful as this.

For a 5 per cent. plaster the writer recommends the following proportions: ℞.—Soap plaster (U. S. P.), ℥j; olive oil and salicylic acid, of each 24 grains. For a 10 per cent. plaster no olive oil is required, the salicylic acid (forty-eight grains to the ounce) being sufficiently softening to make the required soap plaster a moderately firm plaster mass, that without or with the aid of a little heat can be spread on kid or muslin. When large surfaces are to be covered, heat, of course, will facilitate the spreading; but to adhere well plasters should not be too soft. In cases where a 20 per cent. plaster is required I have found the following formula the best: ℞.—Lead plaster (U. S. P.), ℥j; yellow wax, gr. xlviij; salicylic acid, gr. cv. It will thus be noted that the action of salicylic acid on soap plaster and on lead plaster is peculiar, tending to soften materially the plaster mass.

I have referred specially to salicylic acid as the active drug because in these cases, in one strength or another, experience has proved it to be an excellent remedy; but the other drugs named are also valuable in suitable cases in plaster form. I cannot leave this subject without referring to a certain plaster of this kind, the formula for which has been published by Dr. H. G. Klotz, of New York City.[1] The original formula of late has been somewhat improved, and Dr. Klotz now gives the following as preferable to that first published many years ago: ℞.—Diachylon plaster (U. S. P.), 60 parts; soap plaster (U. S. P.), 25 parts; yellow wax, 2 parts; vaseline, 8 parts; salicylic acid, 5 parts. The salicylic acid is mixed with the vaseline and added to the liquefied mixture of the plaster as soon as the mass begins to stiffen. This plaster I have found to be more friable and lumpy, and less adhesive than the formula of the writer, already given. It is, nevertheless, distinctly useful, and can be recommended.

The value of the treatment of eczema rubrum of long standing by means of sapo mollis and water applied with friction, followed by the application of freshly prepared diachylon ointment spread on strips of muslin and bound on with a bandage, must be referred to. It is an excellent method of treatment in suitable cases; but the applications, both of the soap and of the ointment, must be made neatly in order to obtain satisfactory results. The main disadvantages in employing it are the amount of time consumed twice daily in the dressing, and the

[1] New York Medical Journal, September 17, 1887.

cost of the ointment, a considerable amount of ointment being requisite for each application. Many cases of eczema rubrum, especially circumscribed forms, have at different times yielded to its efficacy in my hands, and I have frequently taken occasion to speak well of the method. Thirty years ago it was much employed by the elder Hebra in Vienna, and in most cases with great success.

In chronic, much thickened or verrucous patches of eczema of the leg, solution of potassa, twenty or forty grains to the ounce, may be applied occasionally, the effect being counteracted by such emollient ointments as diachylon or a soothing diachylon soap plaster like Klotz's. Over small, circumscribed, rebellious areas, with much thickening of the skin, multiple scarification sometimes proves useful; also the application of a blister. The great value of roller bandages, properly applied, in eczema of the leg, affording not only support, but also the close application of the ointments, pastes, or plasters employed, need scarcely be referred to. The sheet-rubber bandage, while of service in some cases, must be employed with discretion; for it not infrequently aggravates the disease, not only by contact with the skin, but also by exerting undue pressure, more in one part than in another part.

There remain other methods of treatment and other local remedies to be spoken of, the first of which I shall refer to being the glycerin-gelatin preparations, of special value in dispensary practice. The several formulæ in use vary somewhat according to the amount of glycerin and gelatin they contain, the more flexible having a larger proportion of glycerin. An excellent formula for hospital and dispensary practice is the following: ℞.—Gelatin and zinc oxide, of each, 10 parts; glycerin and water, of each, 40 parts. This gives a product which, in the usual temperature of a living-room, is firm; but being heated in a vessel on a hot-water bath soon becomes fluid. All glycerin-gelatin preparations require heating and melting before they are applied. The application is made with a stiff bristle-brush, one layer being painted on over another. Where a firm dressing is called for, a layer of gauze or muslin is smoothly applied and glued down with another coating of glycerin-gelatin. There are certain points to be observed before making the first application and with each change of the dressing. The leg should be thoroughly cleansed with hot water and soft soap, scrubbed, and disinfected with a ½ to 1 per cent. corrosive-sublimate lotion. The slight bleeding that may take place is beneficial rather than harmful. If large ulcers are present, they may, after disinfection, be dusted lightly with iodoform, acetanilid, or some other similar powder; and if the secretion is abundant, a sterile gauze-dressing should cover it. Small ulcers need no special consideration and are to be treated the same as the eczema. In from a quarter- to a half-hour after the last coating of glycerin-gelatin has been put on the dressing is usually dry enough for the

patient to go out, and within twenty-four hours it is entirely dry and firm. It may be covered with a thin layer of absorbent cotton and a roller bandage. The formula given may be varied by the addition of more or less glycerin and zinc oxide, according as stiffness or flexibility is required. Various drugs, especially ichthyol (2 per cent.), may be incorporated in the jelly when called for; but the simple fixed dressing is valuable in itself. It possesses the following advantages: It causes no irritation, and in most cases healing of the ulcers and the cure of the eczema begin at once. It serves as a protection against scratching and infection from the outside. It can readily be washed off with water, when this is desired. The latter should not be done too often, twice a week or once every five or six days being usually sufficient, unless the secretion is profuse.

Ammoniated mercury and calomel, in the strength of from twenty to sixty grains to the ounce, are of especial service in small, subacute patches that may be benefited by inunction. For the same forms of the disease an ointment of four grains each of red precipitate and mercuric sulphide to the ounce and an ointment of mercuric sulphide, five grains, sublimed sulphur, two drachms, lard, six drachms, are useful. These ointments are also of much service in subacute and chronic eczematous patches in other regions as well, especially upon the scalp. Patches upon the arms and forearms may also be benefited by them, but pastes generally do better here, and also upon the trunk.

Inunction, even with mild ointments, oils, or fats of any kind in eczema upon the regions where the skin is tender, should always be prescribed with caution, the act of rubbing in itself generally tending to spread the disease.

Eczema of the Hands and Fingers. While eczema of the hands and fingers is common, the disease does not show the same predilection for the feet and toes, although the soles are often invaded. Upon the hands the erythematous, erythemato-squamous, fissured, vesicular, vesico-papular, vesico-pustular, and pustular varieties are all prone to occur, and hence a multiform eruption here is not uncommon. Fissures are also frequent lesions on the backs of the fingers, over the knuckles, and elsewhere, being often deep and persistent. Not infrequently the lesions on the hands and fingers are much the same in character as in scabies, and the diagnosis between these two diseases in this region may be embarrassing in the first and second weeks. The predilection of scabies for invading the hands and fingers need hardly be mentioned. It is worth remarking that in the early stages of scabies the lesions are more discrete than is usually the case in eczema. The latter disease, moreover, generally spreads more rapidly than scabies. Eczema of the hands and fingers is usually intractable in adults, and is prone to run a subacute and chronic course. In the many cases that have passed under my

observation I have repeatedly been struck with the fact that a distinctly neurotic or depressed condition of the patient existed, and I have often found it practically important to improve or cure this condition by general treatment before complete recovery will set in. In many cases of eczema of the fingers the state of the nervous system is much the same as exists in almost all cases of cheiro-pompholyx, which disease, as is now well known, is distinctly neurotic in nature. The milder mercurial ointments, as calomel or white precipitate, ten or twenty grains to the ounce, are often of service, and, moreover, are neat and cleanly applications. They should be used sparingly and rubbed in gently but firmly, three times a day for from ten to twenty minutes. To these ointments five or ten minims of the compound tincture of coal-tar to the ounce may in some cases be added with advantage. Strong, tarry ointments, however, are seldom tolerated. Litharge-glycerin-starch pastes (possessing a color resembling the flesh-tint), as in the following formula, are often serviceable in the subacute, papulo-vesicular variety of the fingers: ℞.—Litharge, 10 parts; glycerin, 30 parts; starch, 10 parts; vinegar, 60 parts; to be cooked to 80 parts. Salicylic acid-starch-vaseline paste, 2 or 3 per cent., to which sometimes powdered camphor in like strength or stronger may be added, is also worthy of mention.

Upon small patches certain drugs, as tar and salicylic acid, may be incorporated with compound tincture of benzoin or with collodion or liquor gutta-percha, and applied as a fixed dressing. The glycerin-tragacanth mucilage, already spoken of, is a similar and cleanly method of applying certain active remedies, as carbolic acid, and, like the glycerin-gelatin preparation, it acts as a protective. Rubber gloves were at one time regarded with much favor for eczema of the hands and fingers; but rubber often proves irritating to the skin, and I cannot speak well of this employment, except to wear temporarily to protect the hands from such injurious influences as soap and water.

Eczema of the Palms and Soles. The disease occurs much more frequently on the palms than on the soles. Occurring here it in almost all instances takes on from the beginning a chronic course, and is characterized by one or more small or large, scaly patches, with thickening and fissuring of the skin. The latter feature may be insignificant or marked, superficial fissures following the natural lines of the skin or at right-angles to them being more common than deep fissures accompanied with bleeding. The latter occur chiefly in the hard-working classes, laborers, and drivers who are exposed to the injurious influences of cold or wet weather, chemicals, alkalies, and the like. In chronic eczema of the palms and soles—and I may here observe that both palms or both soles are usually simultaneously invaded, and that when the palms are invaded the soles usually escape—there is apt to be considerable scaling,

with thickening of the corneous layer of the epidermis and of the corium. The patches may be diffuse or circumscribed, but they are not often marginate or serpiginous. Everyone has at one time or another been perplexed in the diagnosis between erythemato-squamous eczema and syphilis of the palms and soles. In some cases the lesions simulate each other very closely, so that it is necessary to study attentively not only the lesions themselves, but also their course and evolution. Much is to be learned by studying the natural course of a disease. There is one point that I have repeatedly noticed in this form of eczema, namely, that the inflammatory action is usually more pronounced and more variable in its course than in syphilis. Notwithstanding that eczema of this region may be eminently chronic, it will be observed in almost all cases that the pathological process is more subject to exacerbations and to heat and itching than occurs in syphilis. In many cases I do not think that the amount of keratosis present, as shown by the scaling, is an index of much value, for both diseases show this feature often in a marked degree. The amount of thickening of the epidermis, verrucosity, and fissuring, may be as great in one disease as the other, especially upon the soles.

There is no question concerning the rebelliousness of many cases of eczema of the palms and soles. This is proverbial. At the same time, if general as well as local treatment is brought to bear upon the disease, improvement and cure may be hoped for within a reasonable period. Some erythemato-squamous cases of this kind are sensitive and irritable, repelling not infrequently even the blandest oils and fats; while in the other instances the disease is relieved by such moderately stimulating ointments as acetanilid, thirty or sixty grains to the ounce of cold-cream ointment. Tar is not well tolerated in the majority of cases, nor is carbolic acid, as a rule, acceptable. When tar is prescribed it should at first be employed cautiously. Mild ointments of calomel, weakened citrine ointment, or ammoniated mercury, or of ichthyol, resorcin, or sulphur, ten or twenty grains to the ounce, are at times well borne. When much epidermic thickening is present, as is often the case on the soles, one of the 5 or 10 per cent. salicylic-acid plasters, referred to in considering eczema of the legs, may be used generally with much benefit, and they usually afford, moreover, ease and comfort because of their emollient effect, the latter point being of considerable importance in cases where the soles are concerned. The fixed dressings, especially plasters, in cases where they can be applied with comfort to the patient, are not only neat and cleanly, but generally prove effective and desirable methods of treatment. At times boric-acid lotions containing glycerin are acceptable, the proportion of one part of glycerin to eight or twelve parts of water being about right for the majority of cases. In concluding the observations on eczema of the palms in particular I

desire to repeat that judicious internal and general treatment should always receive due consideration; for the same laws in pathology that occasion syphilis to localize itself here and prove so obstinate hold good for eczema of this region, and everyone knows the efficacy of internal medication in syphilis of the palm, and how rebellious, on the other hand, it usually is to mere local remedies.

I have thus directed attention in a very practical way to the local treatment of this important and widespread disease as it occurs on the several regions of the general surface where it is most prone to manifest itself. Mention has been made of the most valuable remedies and methods of therapy, but it has been beyond the scope of this article to refer to all of the remedies of merit and their application. No special attention has been given to the internal or general treatment of the disease, because their importance and value are so great, and the field so extensive, that this topic must be reserved for another occasion.

A STUDY OF THIRTY-ONE CASES OF CHLOROSIS,

WITH SPECIAL REFERENCE TO THE ETIOLOGY AND THE DIETETIC TREATMENT OF THE DISEASE.

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The fact that the literature relating to the etiology of chlorosis is increasing yearly shows that none of the hypotheses thus far offered is entirely satisfactory.

Up to the year 1872 disorders of the female generative organs were regarded as giving rise to the complex of symptoms which we designate as chlorosis. This view was based essentially upon the observation that chlorosis occasionally develops in young girls in whom menstruation has previously been more or less regular, but has ceased upon the development of the disease in question. Virchow[1] was the first to show that such a hypothesis is untenable, as he found the existence of pelvic disease inconstant in the bodies of chlorotic females. His anatomical observations, on the other hand, led him to believe that an etiological connection exists between chlorosis and a congenital hypoplasia, or imperfect development of the cardio-vascular system, especially of the aorta. Similar observations were made by Rokitansky,[2]

[1] R. Virchow: Ueber die Chlorose und die damit zusammenhängenden Anomalien des Gefässapparates, etc. Berlin, 1872.

[2] Cited by Virchow, loc. cit.

who mentions a case in which the abdominal aorta was no larger than an iliac or even a carotid artery. This hypoplasia Virchow refers to an abnormal condition of the mesenchyma, resulting in a defective development of the organs which are derived from this layer, viz., the bloodvessels, the blood, and the blood-forming organs—the bone-marrow and the spleen. There can be no doubt that such an anomalous condition must be looked upon as an important predisposing cause; but it can hardly be regarded as the cause of the disease, as the number of cases in which chlorosis is clinically observed is greater than that in which a hypoplasia of the cardio-vascular system is seen upon the post-mortem table. The fact, moreover, that the disease promptly yields to treatment in the great majority of instances is strongly against the value of Virchow's hypothesis.

Rosenbach[1] and others look upon tight corset-lacing and the resulting compression of the respiratory organs as the principal causes of chlorosis, and believe that the "excess" of hæmoglobin disappears as a consequence.

Meinert[2] likewise regards the corset as the primary cause, but ascribes the chlorosis to gastroptosis with vertical or subvertical position of the stomach, which he claims to have observed in every instance. In 15 per cent. of his cases, moreover, he was able to demonstrate the existence of a movable kidney. According to his view, the gastroptosis is an anatomical factor causing an increased irritability of the sympathetic nerve-plexuses in the abdomen, and notably the solar plexus, which governs the production of hæmoglobin in the spleen. A chlorotic attack follows whenever, owing to special psychic or physical overexertion, increased demands are made upon the nervous system. In short, according to Meinert, chlorosis is essentially a neurosis dependent upon the existence of enteroptosis.

Chlorosis not infrequently occurs in girls who have never worn a corset, so that this factor may be disregarded. The question, however, remains: Does a gastroptosis, viz., splanchnoptosis, occur in every case of chlorosis whether or not a corset has been worn? Leo[3] finds gastroptosis to be the rule in cases in which a corset has been worn, but also states that he has found the lower curvature of the stomach well above the umbilicus in a number of instances.

Pick[4] reports upon "atonic conditions of the stomach and frequent dilatation." According to him, the chlorosis is due to the absorption of poisonous products of albuminous decomposition, and the deleterious

[1] O. Rosenbach: Korsett und Bleichsucht, 1895.
[2] Meinert: Zur Aetiologie der Chlorose. Wiener med. Wochensch., 1893.
[3] H. Leo: Ueber Gastroptose und Chlorose. Deutsche med. Wochensch., 1896, p. 177.
[4] A. Pick: Zur Therapie der Chlorose. Wiener med. Wochensch., 1891, p. 939.

effects of these upon the general metabolism. He also states that the breath of chlorotic patients frequently has the odor of skatol. His treatment accordingly consists in the administration of creosote and in gastric lavage. In sixteen cases thus treated good results were noted.

It seemed of interest to the writer to determine, first, the frequency with which anæmic conditions in general are associated with splanchnoptosis and atony; and, secondly, to repeat the work of Meinert, Pick, and Leo. The results are given in Tables I., II., and III.

TABLE I.

Showing the relation existing between splanchnoptosis and anæmia, viz., chlorosis.

No.	Sex.	Age.	Gastroptosis.	Nephroptosis.	Hæmoglobin.
1	F.	?	No.	Yes.	80 pr. ct.[1]
2	M.	29	Yes.	"	50 "
3	F.	?	No.	"	30 "
4	F.	19	"	"	80 "
5	F.	?	"	"	62 "
6	F.	38	"	"	50 "
7	F.	60	"	"	35 "
8	F.	?	"	"	35 "
9	F.	44	Yes.	"	75 "
10	F.	?	"	No.	75 "
11	F.	?	No.	Yes.	40 "
12	F.	?	"	"	80 "
13	M.	56	Yes.	"	80 "
14	F.	?	No.	"	65 "
15	F.	30	Yes.	"	50 "
16	F.	?	No.	"	70 "
17	F.	?	Yes.	"	60 "
18	F.	32	"	"	80 "
19	M.	22	No.	"	30 "
20	M.	40	"	"	85 "
21	F.	?	"	"	65 "
22	F.	?	"	"	60 "
23	F.	?	Yes.	"	70 "
24	M.	22	No.	"	70 "
25	F.	36	"	"	33 "
26	F.	?	"	"	65 "
27	F.	?	Yes.	"	60 "
28	F.	?	No.	"	65 "
29	F.	?	Yes.	"	80 "
30	M.	26	"	"	110 "
31	F.	18	"	"	50 "
32	F.	?	No.	"	35 "
33	F.	19	"	"	55 "
34	F.	24	Yes.	No.	35 "
35	F.	29	No.	Yes.	60 "
36	F.	28	"	"	40 "
37	F.	?	"	"	50 "
38	F.	22	Yes.	"	25 "
39	F.	25	No.	"	65 "

[1] These figures have reference to the scale of Fleischl's hæmometer.

TABLE II.

Showing the relation existing between simple atony of the stomach and anæmia, viz, chlorosis.

No.	Age.	Sex.	Hæmoglobin.
1	29	M.	50 per cent.
2	39	F.	75 "
3	58	M.	60 "
4	?	F.	80 "
5	?	F.	80 "
6	40	M.	85 "
7	21	M.	60 "
8	?	F.	60 "
9	23	M.	70 "
10	40	F.	70 "
11	22	M.	70 "
12	?	F.	50 "
13	?	F.	65 "
14	40	F.	50 "
15	?	F.	60 "
16	12	M.	65 "
17	26	M.	80 "
18	20	F.	70 "
19	29	F.	60 "
20	17	F.	25 "
21	20	F.	25 "
22	28	F.	40 "
23	25	F.	65 "
24	18	F.	45 "
25	12	F.	66 "

An examination of Table I. shows that splanchnoptosis is associated with anæmia in a fairly large percentage of cases, and this is true more particularly of nephroptosis. There remains, however, a not inconsiderable number in which amounts of hæmoglobin are found which, for city-dwellers at least, must be considered as nearly normal, and in one case, notwithstanding the existence of a most marked gastroptosis and nephroptosis, 110 per cent. of hæmoglobin was observed with Fleischl's hæmometer.

The same may be said of simple, uncomplicated atony.

An analysis of Table III. shows that splanchnoptosis is by no means invariably associated with chlorosis, although a corset was worn in almost every instance. The conclusion, hence, appears justifiable that *while splanchnoptosis is frequently observed in cases of chlorosis, it cannot be regarded as the essential causative factor.*

If, moreover, we study the cases which are associated with splanchnoptosis and atony, it will be found that while with appropriate treatment the chlorotic condition gradually disappears, the splanchnoptosis and atony still persist. Atony of the stomach, as well as splanchnoptosis, is quite common in the male, in whom chlorosis is far less fre-

quently observed than in the female, not to speak of the *married* female, in which descent of the stomach and nephroptosis are so often observed in the absence of chlorosis.

Atony of the stomach and splanchnoptosis have in themselves no part in the causation of chlorosis. In making this statement, however, the writer does not wish to convey the impression that the existence of splanchnoptosis is of no significance in such cases. There can be no doubt that the anæmic condition will be more difficult to treat, especially if a marked grade of nephroptosis is also present.

It has been pointed out that chlorosis, according to Meinert's idea, is essentially an affection of the sympathetic nervous system. This theory is also held by Jones and Murri.

Jones[1] found that in rabbits, after section of the splanchnic nerves, comparatively slight stimulation, such as the injection into the intestine of dilute saline solution, is sufficient to produce marked hyperæmia of the intestinal mucosa and hemorrhages. Having in view the well-known fact that dilatation of the bloodvessels supplying the sexual organs of the female occurs during the process of menstruation, he assumed that under certain conditions the vaso-dilatation is present in other organs supplied by the abdominal sympathetic system, leading to gastro-intestinal hyperæmia, and even to hemorrhages, which in turn give rise to chlorosis. A number of data can be brought forward in support of this view. Hässlin[2] was able to demonstrate the presence of hæmatin and iron in the feces of numerous cases of chlorosis. Kuttner[3] also has drawn attention to the fact that gastric hemorrhages are by no means uncommon in cases of chlorosis, although hæmatemesis does not necessarily occur. He states that gastric hemorrhages occurring periodically are not infrequently associated with menstruation, and that the periodical hemorrhages observed in cases of amenorrhœa stand in a generic relation to this condition. He does not regard such hemorrhages as taking the place of the physiological menstrual flow, but agrees with Jones,[4] that the stimulus caused by the hyperæmic condition of the sexual organs during the process of menstruation may, under certain conditions, extend to other portions of the sympathetic nervous system, causing hyperæmia. According to modern views, however, a hemorrhage—aside from traumatism—can only occur when the bloodvessel-walls or their surroundings, such as the gastro-intestinal mucosa, are diseased.[5] In this connection it is of interest to

[1] Ll. Jones: Preliminary Report on the Causes of Chlorosis. Brit. Med. Journ., 1893, ii. p. 670.
[2] v. Hässlin: Münch. med. Wochensch., 1890, No. 14.
[3] L. Kuttner: Ueber Magenblutengen und besonders über deren Beziehungen zur Menstruation. Berlin. klin. Wochensch., 1895, Nos. 7, 8, and 9.
[4] Jones, loc. cit.
[5] M. Bresgen: Ueber Epistaxis. Eulenburg's Real-Encyclop., 1886, vol. vi. p. 474.

note that Virchow[1] found the arteries of chlorotic females abnormally thin throughout, owing to atrophy of the muscular coat, and that the intima frequently was waxy.

Kuttner has drawn attention to the fact that the macroscopic and even the microscopic examination of the gastric contents is not always sufficient to demonstrate the presence or absence of blood, as the appearance remains unaltered if the hemorrhage has been slight. Whenever, then, the macroscopic and microscopic examination yields negative results the method recommended by Müller[2] and Weber[3] should be employed. To this end the gastric contents are treated with a few cubic centimetres of concentrated acetic acid and extracted with ether. Should the ether not separate out as a clear layer after a few minutes, a few drops of alcohol are added. If the ether then remains colorless, no blood-pigment is present, while a brownish-red color indicates the presence of acetate of hæmatin. As a similar but yellowish-brown and much less intense discoloration of the ether may be produced by other pigments, such as biliary coloring-matter, it is well in doubtful cases to test the ethereal extract with tincture of guaiacum. A positive result indicates the presence of blood-coloring matter. The same may be said if, upon spectroscopic examination of the ethereal extract, an absorption band is discovered at the junction of the red and yellow.

Most valuable is the iron-test of Korczynski and Jaworski.[4] A small amount of the sediment to be examined is treated with a pinch of potassium chlorate and a drop of concentrated hydrochloric acid, and the mixture carefully heated until it has become decolorized. If necessary, more of the hydrochloric acid is added. As soon as all the chlorine has been driven off, one or two drops of a dilute solution of potassium ferrocyanide are added, when in the presence of blood-coloring matter a distinctly blue color is obtained, owing to the formation of Prussian-blue.

The writer has been able to examine the gastric contents of only five chlorotic patients in this manner. In four a negative result was obtained; the fifth was one of ulcer complicating the chlorosis, and in this case blood-coloring matter was found.

Opposed to the correctness of Jones's hypothesis, however, is the fact that chlorosis is at times observed in young girls in whom menstruation has not as yet been established. The writer has a young chlorotic female under observation at the present time in whom chlorosis developed at

[1] Virchow, loc. cit.

[2] Seiffert und Müller: Taschenbuch der med.-klin. Diagnostik, 1893, p. 69.

[3] H. Weber: Ueber den Nachweis des Blutes in dem Magen und Darminhalte. Berlin. klin. Wochensch., 1893, No. 19.

[4] Korczynski und Jaworski: Klinische Befunde bei Ulcus und Carcinoma. Deutsche med. Wochensch., 1886, Nos. 47–49.

the age of sixteen years, while the first signs of menstruation did not appear before the twentieth year. It is difficult, moreover, to understand why the blood-condition usually improves upon the administration of iron, unless iron causes vaso-constriction, which is not borne out by experience, as hyperæmia of the gastrointestinal mucosa and even inflammation may result from its use.

An analysis of post-mortem records, as far as such have been accessible to the writer, shows, furthermore, that ecchymoses of the gastrointestinal mucosa are by no means commonly observed. Hoffmann,[1] also, speaks of the infrequency of hemorrhages in chlorosis, and contrasts chlorosis in this respect with other blood-diseases. The conclusion, hence, appears justifiable that *gastrointestinal hemorrhages cannot be regarded as the sole cause of chlorosis.* It is the writer's belief that when they occur they are the *result* of the anæmic condition, and not the cause.

Murri[2] likewise regards chlorosis as a vasomotor neurosis. According to him, an unequal distribution of the blood and an abnormal rapidity of flow, both of which are the result of abnormal impulses starting from the generative organs of the female, constitute the essential factors. Owing to the abnormal excitability of the vasomotor nerves the blood accumulates in the bloodvessels of the viscera, while the peripheral circulation, in consequence of vaso-constriction, is slower than normal. These deviations from the normal circulation cause an increased destruction of red corpuscles, in consequence of the altered chemical composition of the blood. If, furthermore, the peripheral circulation is more especially disturbed by cold and similar causes, the already existing anæmia is still further increased. As Murri has not yet published his observations in detail, it is impossible to analyze his hypothesis at present. So much, however, is certain that cold is capable of exerting a most deleterious influence upon the blood of chlorotic patients. v. Noorden[3] thus cites two cases of chlorosis in which, following the application of cold douches and the wet sheet, the previously light-colored urine became dark and very rich in hydrobilirubin, which modern researches have shown to indicate an increased destruction of hæmoglobin. The observation, moreover, is quite common that chlorotic patients frequently are made distinctly worse when permitted to indulge in sea-bathing without previous preparation. v. Noorden, however, states that he does not attach much importance to his observations upon the effect of cold as far as the etiology of chlorosis is concerned, and adds that similar results may frequently be obtained in the case of weakly patients.

It has been pointed out that Pick considers chlorosis the result of an

[1] F. A. Hoffmann: Lehrbuch der Constitutionskrankheiten, p. 45. Stuttgart, 1893.
[2] Murri: Pathogénie de la Chlorose. Semaine Méd., 1894, p. 162.
[3] v. Noorden: Lehrbuch der Pathologie des Stoffwechsels, pp. 265-346.

autointoxication, and that he claims to have obtained good results from gastric lavage and the administration of creosote.

Clark[1] may be regarded as the principal exponent of this school; but while Pick refers the autointoxication to atony and dilatation of the stomach, Clark regards the constipation which so often accompanies chlorosis, and the absorption of poisonous products of albuminous putrefaction, as the essential causes of the disease. This view is also held by Nothnagel.[2]

According to Bunge,[3] increased intestinal putrefaction, resulting in an increased production of sulphuretted hydrogen, must be regarded as the primary cause of chlorosis. He reasons as follows: during the period of puberty the female assimilates an excess of iron and stores it in the liver, in order to supply the fœtus, when pregnancy occurs, for the first year. Whenever, then, this process is interfered with, in consequence of the excessive production of sulphuretted hydrogen in the intestinal tract, the iron which is introduced in the form of food being transformed into insoluble sulphide of iron, chlorosis will result if the accumulation of iron still continues. The increased degree of intestinal putrefaction Bunge and his followers refer to a deficient secretion of hydrochloric acid in the stomach. The correctness of the hypothesis that chlorosis is essentially the result of an autointoxication, due to increased intestinal putrefaction, has been rendered doubtful by the researches of Rethers,[4] who found that the conjugate sulphates were usually not increased in cases of chlorosis.

In a previous communication[5] the writer has pointed out that in diseases of the stomach the elimination of indican must be considered as the more important factor in the determination of the degree of intestinal putrefaction, as the phenols are not necessarily produced in excessive amounts, so that the estimation of the conjugate sulphates does not furnish as valuable information as the examination for indican. It was, hence, thought advisable to examine systematically the urine of chlorotic patients. Attention was at the same time directed to the existence of constipation. The results obtained are given in Table III.

An analysis of this table shows that an excess of indican in the urine of chlorotic patients is rather the exception than the rule, and that while constipation exists in the majority of cases, normal relations are found in a not inconsiderable number.[6] The conclusion thus appears

[1] Clark: Chlorosis. Lancet, 1887, ii. p. 1003.

[2] Nothnagel: Ueber Chlorose. Wiener med. Presse, 1891, p. 1925.

[3] Bunge: Physiologische Chemie, 1887, p. 86; also, Verhandlungen des Congresses für innere Medizin, 1895.

[4] Th. Rethers: Beiträge zur Pathologie der Chlorose. Diss. Berlin, 1891.

[5] C. E. Simon: Modern Aspect of Indicanuria. AMERICAN JOURNAL OF THE MEDICAL SCIENCES, July and August, 1895.

[6] The writer has pointed out at various places that constipation in itself does not cause increased indicanuria; this fact is also well shown in the table. See C. E. Simon, Clinical Diagnosis. Philadelphia, 1896.

justifiable that *constipation and increased intestinal putrefaction, as far as the known aromatic bodies are concerned, cannot be regarded as essential factors in the production of chlorosis.*

TABLE III.

No.	Name.	Sex.	Age	Hb.	HCl.	Indican.	Atony.	Dilatation.	Gastroptosis.	Nephroptosis.	Constipation.	Remarks.
				pr.ct.								
1	Miss B.	F.	20	50	Increased.	Increased.	No.	No.	No.	No.	Yes.	Ulcus ventriculi.
2	Miss T.	F.	24	45	Increased.	Not increased.	No.	No.	No.	No.	No.	
3	D. S.	F.	29	28	Increased.	Not increased.	No.	No.	No.	No.	Yes.	
4	Miss S.	F.	22	55	Absent.	Increased.	No.	No.	No.	No.	Yes.	
5	Miss S.	F.	17	60	Diminished.	Increased.	No.	No.	No.	No.	Yes.	
6	Miss R.	F.	30	50	Normal.	Not increased.	No.	No.	No.	Yes.	No.	
7	Miss G.	F.	?	35	Normal.	Not increased.	No.	No.	No.	Yes.	No.	
8	Miss S.	F.	19	55	Absent.	Increased.	No.	No.	No.	Yes.	No.	
9	Miss A.	F.	24	35	Absent.	Increased.	Yes.	No.	Yes.	No.	Yes.	
10	Miss B.	F.	29	60	Increased. 0.3 pr.ct.	Normal.	Yes.	No.	Yes.	Yes.	No.	
11	Miss B.	F.	15	40	Normal.	Not increased.	No.	No.	No.	No.	No.	
12	A. B. B.	F.	17	25	Increased. 0.5 pr.ct.	Not increased	Yes.	No.	No.	No.	No.	
13	Miss S.	F.	20	25	Diminished.	Increased.	Yes.	No.	Yes.	No.	No.	
14	Miss B.	F.	28	40	Increased. 0.5 pr.ct.	Not increased.	Yes.	No.	No.	Yes.	No.	
15	Miss B.	F.	24	55	Normal.	Not increased.	No.	No.	No.	No.	No.	
16	Miss F.	F.	25	50	Diminished.	Increased.	No.	No.	No.	No.	No.	
17	Miss H.	F.	?	50	Diminished.	Increased.	No.	Yes.	No.	Yes.	No.	Ulcus.
18	Miss K.	F.	?	45	Normal.	Not increased.	No.	No.	No.	No.	No.	
19	Miss Y.	F.	22	25	Normal.	Not increased.	Yes.	No.	Yes.	Yes.	No.	
20	Miss L.	F.	25	65	Normal.	Not increased.	Yes.	No.	No.	Yes.	No.	
21	Miss B.	F.	18	45	Increased. 0.5 pr.ct.	Not increased.	Yes.	No.	No.	No.	Yes.	
22	Miss S.	F.	24	75	Normal.	Not increased	No.	No.	No.	Yes.	No.	Has been under treatment for chlorosis.
23	Miss W.	F.	19	75	Diminished.	Increased.	Yes.	No.	No.	No.	No.	Has been under treatment for chlorosis.
24	Miss G.	F.	19	25	Absent.	Not increased.	Yes.	No.	Yes.	Yes.	Yes.	Lactic acid.
25	Miss H.	F.	21	20	Absent.	Not increased.	Yes.	No.	Yes.	Yes.	Yes.	Lactic acid.
26	E. W.	F.	17	37	.....	Not increased.	No.	No.	No.	No.	Yes.	
27	M. G.	F.	15	33	Increased.	Not increased	Yes.	No.	Yes.	Yes.	Yes.	
28	M. C.	F.	24	18	Increased.	Increased.	Yes.	No.	No.	No.	Yes.	Ulcus.
29	L. S.	F.	30	30	Normal.	Not increased.	Yes.	No.	No.	No.	Yes.	
30	A. W.	F.	35	33	Normal.	Not increased.	No.	No.	Yes.	Yes.	Yes.	
31	E. B.	F.	12	55	Absent.	Increased.	Yes.	No.	No.	No.	No.	

It has been pointed out that Bunge and others regard a diminished secretion of hydrochloric acid in the stomach as the principal cause of increased putrefaction, and, hence, as the primary cause of chlorosis. It will be necessary then to study briefly the various observations which have been made in this direction.

Manassein[1] was the first to note that, in animals, during fever and in anæmic conditions practically no gastric juice is secreted, and, hence, concluded that in the human being also the secretion of hydrochloric acid is diminished in anæmic conditions, such as chlorosis.

Zander[2] found that better results are obtained in the treatment of chlorosis under the administration of hydrochloric acid than of iron, and thus arrived at the same conclusion.

Mordhorst[3] takes the same stand, as he claims to have found a smaller amount of hydrochloric acid, on an average, in cases of chlorosis than normally.

Lenhartz,[4] using Congo-red as a test, observed the absence of free hydrochloric acid in 45.6 per cent. of his cases, and also states that on an average the total acidity was below normal.

Rosenbach[5] obtained similar results.

Ritter and Hirsch,[6] employing the method of Kahn and v. Mehring, likewise found amounts which on an average were below normal, but not to a marked degree.

Increased amounts of free hydrochloric acid were found by Riegel, Grüne, Osswald, Schätzell, and Cantu.

In three cases of chlorosis which were carefully studied by Riegel[7] the total acidity in terms of hydrochloric acid corresponded to 0.22 to 0.26 per cent. in the first, 0.23 to 0.30 per cent. in the second, and 0.28 to 0.46 per cent. in the third. In this manner he explains the not infrequent occurrence of gastric ulcer in cases of chlorosis and the anæmias in general.

Grüne[8] obtained amounts exceeding 0.5 per cent. In one instance he found 0.58 per cent. He states that he never found less than 0.28 per cent. His material consisted of twenty-eight cases, in nine of which the chlorosis was associated with ulcer.

Schätzell[9] observed hyperacidity in 73 per cent., a normal acidity in 20 per cent., and subacidity in 7 per cent. of his cases.

Osswald[10] examined twenty-one cases and found a total acidity, corre-

[1] Manassein: Virchow's Archiv, 1872, vol. lv.
[2] Zander: Virchow's Archiv, 1881, vol. lxxviii.
[3] Mordhorst: Diss. Kiel, 1893.
[4] Lenhartz: Deutsche med. Wochensch., 1890, No. 5.
[5] Rosenbach: Entstehung und Behandlung der Chlorose. Leipzig, 1892.
[6] Ritter und Hirsch: Zeitsch. für klin. Med., vol. xiii. p. 430.
[7] Riegel: Zeitsch. für klin. Med., vol. xii.; also Deutsche med. Wochensch., 1886, No. 52.
[8] Grüne: Diss. Giessen, 1890.
[9] Schätzell: See Hoffmann's Constitutions-Krankheiten.
[10] Osswald: München. med. Wochensch., 1894, Nos. 27 and 28.

sponding to 0.20 per cent., in only two cases; in the greater number more than 0.25 per cent. was found, and in some instances even 0.5 per cent. The amount of free hydrochloric acid varied between 0.07 and 0.25 per cent, with an average of 0.15 per cent.

Leube[1] states that while subacidity is the rule in chlorosis, exceptions are not uncommon.

Cantu[2] claims that hyperchlorhydry is characteristic of chlorosis, which may thus be distinguished from other forms of anæmia.

On the other hand, there are observers who maintain that no rule can be laid down regarding the secretion of hydrochloric acid in cases of chlorosis. Rosenheim,[3] v. Noorden,[4] Buzelygan[5] and Gluzinski, and Hoffmann[6] found an increased degree of the total acidity in some, and in others a diminished amount, but in both groups but little beyond the normal. Usually the secretion of hydrochloric acid was normal. The same conclusion has also recently been reached by Schroth.[7]

The author's results are given in Table III.

Salzer's test-meal was employed in every case. For breakfast the patient received 30 grammes of lean, cold roast beef, hashed or cut into pieces sufficiently small not to obstruct the lumen of the stomach-tube, 250 c.cm. of milk, 60 grammes of rice, and one soft-boiled egg. Exactly four hours later the second meal was taken, consisting of 35 to 70 grammes of stale wheat-bread and 300 to 400 c.cm of water. The gastric contents were withdrawn one hour later. In this manner the gastric juice is not only obtained at the height of digestion, but an idea may at the same time be formed of the motor power of the stomach. Under normal conditions the organ should not contain any remnants of the first meal at the time of examination. The free hydrochloric acid was determined according to Töpfer's method, using dimethyl-amido-azo-benzol as an indicator.

An analysis of this table shows that normal amounts were found in 33.3 per cent., hyperchlorhydry in 30 per cent., hypochlorhydry in 16.6 per cent., and anachlorhydry in 20 per cent. It is thus clear that no definite rule can be laid down regarding the secretion of hydrochloric acid in cases of chlorosis. *Neither hyper-, hypo-, nor anachlorhydry can be regarded as the cause of chlorosis.* In the author's estimation, the abnormal results must be explained by the existence of a general neurotic condition, which is frequently observed in cases of chlorosis. In this connection it is of interest to note that increased indicanuria is not found in the majority of chlorotic patients, thus confirming the

[1] Leube: Spezielle Diagnostik., 1893.
[2] Cantu: München. med. Wochensch., 1894, No. 14 (ref.).
[3] Rosenheim: Lehrbuch der Verdauungs-Krankheiten, vol. i.
[4] v. Noorden: Arbeiten über Chlorose. Berlin. klin. Wochensch., 1894, No. 4.
[5] Buzelygan und Gluzinski: Internat. klin. Rundschau, 1891.
[6] Hoffmann, loc. cit.
[7] O. Schroth: Diss. München, 1896.

author's view that increased indicanuria may be regarded as indicating the existence of hypo- or anachlorhydry, if we except ulcer, in which case an increased elimination of indican is usually found associated with hyperchlorhydry. (See Table III.)

Haig[1] has recently suggested an increased production of uric acid, the result of digestive disturbances, as the cause of anæmia and chlorosis. This view the writer cannot share, as in his experience an increased elimination of uric acid is less frequently observed in chlorosis than in conditions which are not associated with anæmia. There is no reason why an increased production of uric acid should take place in chlorosis without a correspondingly increased elimination.

The hypothesis that chlorosis is referable to the repeated losses of blood during the process of menstruation need not be considered, as the disease not infrequently occurs in females before menstruation has been established. It would be difficult, moreover, to explain the reason why chlorosis results in such an infinitesimally small percentage of cases when compared with the total number of menstruating females.

Those, finally, who regard chlorosis as an infectious disease have still to demonstrate the specific bacillus. The occasional occurrence of enlargement of the spleen can hardly be regarded as sufficient evidence. Schroth[2] has met with splenic enlargement only twice in his series of cases, and the writer has only one case of this kind to report in a total of thirty-one cases.

From the brief analysis of the various hypotheses that have thus been offered to explain the etiology of chlorosis it is clear that *there is not one which can be regarded as entirely satisfactory. This statement, however, presupposes the unity of the disease.*

The classification of the various forms of anæmia in use at the present time appears to the writer very unsatisfactory. Strümpell[3] divides the anæmias into primary and secondary anæmias, and under the heading "simple constitutional anæmia" speaks of chlorosis and progressive pernicious anæmia.

Osler[4] likewise distinguishes between a primary and a secondary form, and subdivides the former into chlorosis and progressive pernicious anæmia. From his account it is not clear whether or not he regards the "simple constitutional anæmia" of Strümpell as a form of chlorosis. He merely defines chlorosis as an "essential anæmia met with chiefly in young girls, characterized by a marked relative diminution of the hæmoglobin."

[1] Haig: Causation of Chlorosis. Brit. Med. Journ., 1893, p. 672.
[2] Schroth, loc. cit.
[3] Strümpell: Lehrbuch der speziellen Pathologie und Therapie der inneren Krankheiten, vol. ii. 2, p. 178.
[4] Osler: Practice of Medicine, 1st ed., p. 684.

Not many years ago it was thought that chlorosis occurred only in females about the age of puberty. From time to time cases have been observed, however, in which the chlorotic symptoms appeared much earlier; and Rieder[1] has recently pointed out that the disease may develop much later. He cites three carefully studied cases, occurring in females, in which the disease appeared at the age of thirty, forty, and forty-two years respectively. As criterion he regards: the occurrence of anæmia in the absence of a demonstrable cause, the absence of organic disease, the occurrence of a diminution in the amount of hæmoglobin associated with a fairly normal or but slightly subnormal number of the red corpuscles, and rapid improvement upon the administration of iron.

It appears to the writer that too much stress has been laid upon the occurrence of menstrual abnormalities and the "chlorotic" facies in the diagnosis of the disease. It would be better to discard the term "chlorosis" altogether, as it has reference to a symptom only, viz., the greenish-yellow hue of the skin, which is by no means always observed, its occurrence being largely restricted to brunettes. The abnormalities in the menstrual function can likewise not be regarded as characteristic of the disease, as chlorosis is not only observed before the menses have appeared, but amenorrhœa, menorrhagia, and normal menstruation may all be observed in the course of an attack. Chlorosis, moreover, has also been met with in the male, and the writer's experience has led him to the conclusion that it is not at all rare in that sex. It has been mentioned above that rapid improvement in the condition of the blood following the administration of iron is by some regarded as a criterion in the diagnosis. This can hardly be said to hold good, as cases of chlorosis are frequently seen in which the effect of iron is practically *nil*. There remains for consideration the significance of the condition of the blood. Modern writers state that a diminution in amount of the hæmoglobin, altogether out of proportion to the diminution in the number of the red corpuscles, is characteristic of chlorosis, and may serve to differentiate this form of anæmia from all other forms, viz., progressive pernicious anæmia and the secondary anæmias. It is true that in the majority of cases of chlorosis the number of red corpuscles is practically normal. Thayer[2] found the average number per cubic millimetre of the red corpuscles in forty consecutive cases to be 4,225,181, or over 80 per cent. of the normal, while the percentage of hæmoglobin for the total number was 44.1 per cent. Not rarely, however, cases are seen in which the red corpuscles are greatly diminished in number. Osler states that the lowest count in the series of cases just referred to was 1,932,000. In such ex-

[1] Rieder: Einige Bemerkungen über das tardive Auftreten der Chlorose. München. med. Wochensch., 1893, p. 225.

[2] Thayer: Cited by Osler, loc. cit.

treme instances it will be found that the percentage of hæmoglobin is still lower. If we regard this symptom as pathognomonic of chlorosis, it must also be admitted that the definition of chlorosis must be extended, so as to comprise not only girls about the age of puberty, but also children and adults of both sexes. The writer systematically examined the blood of a large number of patients, and found that a diminution in the amount of hæmoglobin, associated with a normal or but slightly subnormal number of red corpuscles, is far more frequently encountered than is generally supposed, in the absence of organic changes. He has observed, moreover, that "chlorosis" is very commonly seen in children of both sexes between the third and twelfth year, as also in the adult female and in males about the age of puberty and up to the twenty-third year. It was less frequently found in males after the thirtieth year.

In the following table the hæmoglobin estimations and the number of red corpuscles are given in a number of male patients. Organic changes could be excluded in every instance:

TABLE IV.

No.	Name.	Sex.	Age.	Corpuscles.	Hb.
1	R. G.	M.	8	4,236,256	45 per cent.
2	L. H.	"	32	3,476,191	33 "
3	M. T.	"	15	4,565,332	48 "
4	J. H.	"	19	4,435,261	42 "
5	O. H.	"	30	5,221,113	58 "

The question arises: What is the smallest amount of hæmoglobin that may be met with in health? The writer's experience has led him to the conclusion that amounts of hæmoglobin corresponding to 100 or over of Fleischl's instrument are only exceptionally seen in city-dwellers, and that figures varying between 80 and 100 must be regarded as normal for such persons. Percentages lower than 70, when associated with a fairly normal number of red corpuscles, or a diminution less than that of the hæmoglobin, should be regarded as indicating a condition of chlorosis, or of *simple anæmia*, a term which the writer prefers.

If we thus extend the definition of the term "chlorosis," it will be found that the hypotheses set forth above become wholly untenable, providing, of course, that chlorosis constitutes a unity. Congenital hypoplasia, the wearing of corsets, with its attendant evils, viz., compression of the thorax and abdomen, splanchnoptosis, menstrual abnormalities, vasomotor neuroses depending thereupon, autointoxication, as far as our present knowledge goes, are all factors, none of which can be said to be uniformly associated with chlorosis. *As a result of his*

study, the writer has been led to the conclusion that in the great majority of cases chlorosis is essentially a disease of malnutrition, the result very frequently of abnormal feeding in early childhood. Objections may be raised to this opinion on the ground that chlorotic patients are usually well nourished and frequently exhibit a perfectly normal appetite as to the quantity of food; in such cases also the proteid metabolism has been found to be normal.

The latter argument may be answered first. It is true that the proteid metabolism will be found normal, if the case be studied at a hospital, where the patient is obliged to eat what is placed before him, and where he ingests weighed quantities of food. *The chlorotic patient is capable of not only digesting a normal amount of proteid material, but also of assimilating the products of digestion.* It would be faulty, however, to argue from the fact that experiments upon metabolism show a patient to be capable of digesting and assimilating definite quantities of food that the patient's nutrition is not impaired. Metabolic experiments will show that the poor, hard-worked, and ill-fed shop-girl can digest and assimilate a normal amount of nitrogenous food, but experiments are not necessary to show that the same girl's diet at home is widely different from that which she receives in a hospital.

The fact that chlorotic patients are usually well nourished cannot be regarded as a valid objection to the writer's view. In the better-to-do classes it is true that the patients usually, but not always, appear plump and well fed. A superficial examination, however, will show at once that the muscular system is not well developed and that the plump appearance is simply due to excess of fat. In that sense the German beer-drinker with his *embonpoint* and the fat woman of the dime-museum are also well nourished. An excessive deposit of fat does not indicate normal nutrition. The fat chlorotic patient can well be compared to a typical case of obesity, and anæmia is practically common to both. Among the poorer classes, on the other hand, the muscular system is not only usually defectively developed, but fat is also frequently lacking. Every physician probably has seen cases of chlorosis in which the body-weight was ninety-five pounds, or even less.

As to the third objection, namely, that the appetite of chlorotic patients is often normal as to quantity, the writer is willing to admit its truth. He maintains, however, that it is rarely normal as to quality. The capricious appetite of chlorotic girls is proverbial. Their longing for undigestible articles, such as acids, chalk, charcoal, earth, and even spiders, is well known. At the Johns Hopkins Hospital the writer had occasion to study three chlorotic girls—intimate friends—who invariably carried with them a box containing pepper and salt. Of this they partook with apparent relish, and as frequently as Mynheer of fifty years ago consulted his snuff-box. It is not the writer's intention to dwell

upon this form of capricious appetite, however, but to point out the fact that a similar perversion exists regarding staple articles of food. The following cases may serve as illustrations:

CASE I.—M. C., aged twenty-four years. Intense chlorosis. The patient has scarcely ever touched any form of meat but fish. Of the latter she is inordinately fond—particularly when salted. While being treated for ulcer of the stomach, which complicated her condition, she bribed the servants of the house to bring her a piece of salted mackerel. For fats and sweets she has no liking. Toast and tea, with salted fish, have been her usual articles of diet for several years.

CASE II.—A. B., aged twenty-one years; male; this patient has never even *tasted* meat. Since childhood he has lived on little else than milk, coffee, and bread.

CASE III.—C. G., aged five years. Will not touch meat; lives mostly on potatoes, bread and butter, and coffee.

CASE IV.—E. B., aged twelve years. Will eat chicken and turkey, potatoes, bread and butter, milk, and baked apples. Of the latter, as well as candies and cakes, she is very fond. Meats other than those mentioned she will not eat.

CASE V.—E. W., aged seventeen years. Will not eat beef or mutton; does not like milk; eats potatoes, corn- and buckwheat-cakes, oatmeal, occasionally a little breast of chicken; is very fond of candies.

CASE VI.—M. G., aged sixteen years. Rarely eats meat; is a great candy-eater.

CASE VII.—M. H., aged twenty-three years. Lives principally upon toast and tea; rarely touches meat.

Careful questioning, in the writer's opinion, will almost always reveal the fact that chlorotic patients consume a very small amount of nitrogenous food, and particularly of the red meats. The majority of patients are potato-fed and inordinately fond of sweets in every form. On the other hand, cases are met with where meat is consumed in moderate amounts, but usually this is improperly prepared, viz., fried and well-done. Such patients probably obtain more fatty acids than digestible proteid material in this manner.

If the urine of chlorotic patients be systematically examined, the correctness of the writer's statement can be readily demonstrated. The specific gravity is almost always low. Inferences should, however, only be drawn when the specific gravity is determined from a specimen taken from the total quantity of urine voided in the twenty-four hours. The inorganic salts, especially the chlorides and phosphates, are likewise diminished. Most important of all, the elimination of nitrogen is diminished. There are a few exceptions in which the specific gravity and the elimination of nitrogen are increased, and which the writer is not prepared to account for; the rule, however, is that *in chlorosis we meet with a subnormal elimination of nitrogen, referable to the ingestion of an insufficient supply of proteid food, and especially of red meats.* It is the writer's belief that the great majority of cases of chlorosis are thus

primarily produced, and that the various other factors, which have been incidentally mentioned, serve to aggravate the anæmic condition and render it less tractable.

As to the question, How is this perversion of the appetite brought about? it may be said that in early infancy the tendency on the part of physicians and parents is to overfeed; later, when the teeth have appeared and solid food should enter into the child's dietary, the opposite mistake is frequently made. A simple query as to the child's appetite will not reveal the error, as usually the answer is that the appetite is good. If, however, a careful inquiry be made as to what the child eats, it will be found that while a fair amount of milk is consumed, potatoes, cornstarch, bread, and the inevitable chicken-bone form the principal articles of diet. Is it surprising that the child should look pale? Certainly not. Children require much more proteid food in proportion to their body-weight than adults. If iron is then prescribed, a slight improvement may follow, but it is rarely marked, and more often *nil*. Of the correctness of this statement the writer has had occasion to convince himself again and again. Unless proteid food be administered in abundance—and it should be remembered that a child with all its teeth requires a coarser form of diet than milk—it will grow up weak and puny. A distaste for animal food develops and an attack of genuine chlorosis results when demands are made on its nervous system at school. Here the child is regarded as stupid and lazy because it does not accomplish its allotted work as well as other children. "It is kept in school" as a punishment, upbraided by its teachers, teased and worried by its comrades, until finally the increased exertions result in a breakdown. A case in point may serve as an illustration:

R. G., aged eight years. As a baby the child was at first nursed by its mother, but was later brought up "on the bottle." Up to the time the milk-diet was discontinued the general health was good. Various "paps," potatoes, and "chicken-bones" were then added by the mother. Later it was noticed that the child was pale, nervous, easily frightened, twitched in arms and legs and the muscles of the face, had night-horrors, and notwithstanding bodily punishment would wet its bed almost every night. A phimosis was found and circumcision performed. Iron was ordered in small doses, and continued off and on for the next year. The improvement was practically *nil*. The child continued anæmic and nervous up to the age of five years, when it was sent to a private kindergarten. The nervousness increased, and the child was taken away. At the age of six years it was sent to school. Reading and writing lessons apparently did not affect the child in a deleterious manner. Arithmetic, however, proved to be the stumbling-block. The nervousness increased, the anæmia became worse, and was aggravated by a severe attack of influenza. A loud systolic murmur developed at the base; palpitations, shortness of breath, and general exhaustion were the result of even slight exertion. Iron, arsenic, and manganese were all tried, with no benefit. The child's appetite craved starchy food. School was

stopped, several months spent in the country (the child had lived in the country to its fourth year), no medicine was ordered, but a liberal proteid diet with bone-marrow and imported Bavarian beer. In the fall of the same year the murmur had almost entirely disappeared, the general nutrition had improved, and 75 per cent. of hæmoglobin was found with Fleischl's hæmometer.

Here a typical attack of chlorosis developed in a child at the age of six years, in which medication was of no avail, but in which a liberal proteid diet led to a fairly satisfactory result.

Other cases occur in which the child has been fairly healthy during its early childhood, but in which the chlorosis develops during the years of school-life. There can be no doubt that the mental strain is a most important factor, particularly in the case of children who have not inherited a strong constitution. The development of the sexual instinct and its common result, masturbation, moreover, deserve consideration. The writer believes that far too little attention is paid to this subject not only by parents, but also by physicians. In the case of boys the problem is not nearly so difficult to deal with, as the physician, if he suspects the practice of masturbation, will usually not hesitate to direct the father's attention to the existing evil. In the case of girls, however, he will frequently hesitate to communicate his suspicions to the parents. They would be shocked were they told that their daughter is a masturbator. The mere insinuation of such an idea would undoubtedly frequently drive the family to a more "gentlemanly" physician. Masturbation, however, is almost as common among girls as among boys, with the exception perhaps that the habit is not begun so early in the female as in the male. Without doubt, however, masturbation, particularly in weakly children, must be regarded as a most important predisposing cause of chlorosis. The writer has again and again observed that the sediment of urines from masturbating young girls contains very large numbers of epithelial cells, derived from the external genitals, and he believes this appearance to be fairly pathognomonic of masturbation, particularly if an appreciable amount of mucus is present at the same time.

While these factors, viz., mental strain and masturbation, must be regarded as important predisposing causes, a perversion of the appetite, and the resulting malnutrition, are still more important, according to the writer's experience. In the morning the child commonly hastens off to school without having had a sufficient breakfast. If a lunch be taken along, it is often either insufficient in amount, or it has become distasteful by the time recess occurs. The pies and buns which can be readily procured in the neighborhood are, hence, preferred; candies also play their part; and at three o'clock, when the child returns home, the appetite is gone. A late dinner does not mend matters much, and ere long, in consequence of an insufficient supply of food of unsuitable

quality, bad air, the continuous confinement in the same position, mental strain, and masturbation, a chlorotic attack follows in those who have not entered upon life with a specially good constitution.

Among the poorer classes it is well known that a sufficient quantity of suitably prepared meat is only exceptionally found upon the dinner-table. Tea and toast are a form of diet upon which many poor shop-girls live almost exclusively. Lentils, peas, and beans are not sufficiently *aristocratic* for those who are earning *enough* money to buy them. Potatoes, fried meat swimming in fat, oatmeal, corn-, buckwheat-, and griddle-cakes, hot bread, buns, fried tomatoes, tea and coffee are the articles of food most commonly consumed by the laboring classes. Were less money expended by them in imitating the household and habits of the wealthier classes, their children would not so frequently present the puny, anæmic appearance which has given rise to the establishment of fresh-air funds and country homes.

Among young adults it is also usually possible to trace the anæmic condition to an insufficient supply of proteid food. Sedentary habits, sexual excesses, mental strain, worry, grief, are all factors which will lead in time to a general breakdown. The appetite is soon affected, this and that article of food is thought to disagree and is abandoned, until finally a condition develops where the patient is practically starving. The anæmia is thus readily accounted for. A few examples may not be out of place:

N. C., aged thirty years. The family history is fair: the father died from nephritis; the mother, two sisters, and two brothers are living and well. As a child the patient passed through the usual diseases. Her health was good until eight years ago. Her weight then was 118 pounds. At that time her *fiancé* died quite suddenly. Her father's death occurred soon after. Symptoms of failing health began to appear. Her appetite diminished, loss of flesh occurred, weakness resulted, the bowels, regular heretofore, became sluggish. The patient went from bad to worse. Sanitariums were frequented. Amenorrhœa occurred, and a gynecologist was called in consultation. No improvement resulted, and a condition of complete invalidism developed. No hysterical symptoms. When the patient was first seen she weighed 74 pounds, and had only 20 per cent. of hæmoglobin, while the red corpuscles numbered about 3,000,000. Examination of the head, chest, arms, and legs was negative. There existed, however, an exaggerated grade of splanchnoptosis. Examination of the stomach showed moderate atony and hyperchlorhydry. The urine was negative. The patient, who had gradually discarded one article of food after the other, fearing that it disagreed, was placed upon appropriate diet, in which animal proteids predominated. No medication beyond nux vomica was employed. In the course of eight weeks the patient's weight had increased to 86 pounds, and the hæmoglobin had reached 60 per cent.

An attack of true chlorosis here developed following intense grief, which led to perversion of the appetite and profound anæmia. Marked

improvement resulted from the administration of large amounts of proteid food.

Miss X., aged twenty-eight years. The patient's family history is good. Up to the age of twenty-four years she had been strong and well, excepting the usual diseases of childhood. She was engaged to a young man with no prospects of an early marriage. Her evenings were generally spent with her *fiancé*. Her stomach-contents were examined at that time, as she began to complain of indigestion, general lassitude, and slight loss of flesh. Normal results were obtained. The right kidney could then be felt below the costal margin. Heart, lungs, etc., were all normal. A few days later diarrhœa occurred without a demonstrable cause; the urine, which had previously contained a normal amount of indican, gave a most intense reaction, and after Ewald's test-meal not a trace of free hydrochloric acid was found. It was then ascertained that during the preceding evening she had become highly excited sexually, and that an orgasm had occurred without intercourse. A few days later her condition was normal. The following week there was a repetition of the attack, called forth in the same manner. This occurred several times, until the patient was sent to the seashore, without her *fiancé*. Upon her return she was decidedly anæmic; hæmoglobin 25 per cent.; the menses were irregular; marked dyspeptic symptoms existed; there were loss of appetite, constipation, and general prostration. The kidney, moreover, could be felt in the right iliac fossa. She was now given Blaud's pills for three months; after that time the hæmoglobin had increased only to 43 per cent. The iron was then stopped and a liberal proteid diet ordered. She steadily improved, and the last examination showed 84 per cent. of hæmoglobin.

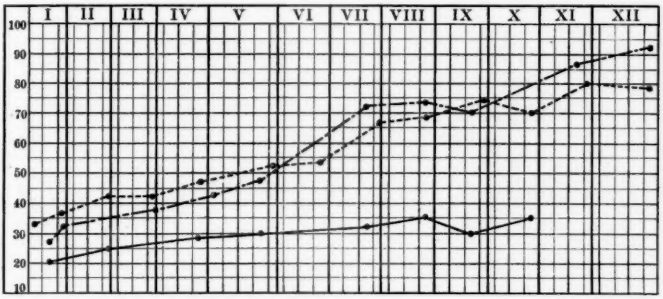
In this case an attack of profound chlorosis developed from ungratified sexual desire; dyspeptic symptoms and anorexia followed, resulting in anæmia. Recovery occurred upon the administration of a liberal proteid diet.

It would be an easy matter to detail many such cases. The writer believes, however, that he has sufficiently demonstrated that *chlorosis is in the great majority of cases the result of malnutrition, dependent upon the consumption of an insufficient amount or of an unsuitable quality of proteid food.*

Heretofore iron has played the most prominent *rôle* in the treatment of chlorotic patients, and Osler states in his *Practice:* "The treatment of chlorosis affords one of the most brilliant instances of the specific action of a remedy. Apart from the action of quinine in malarial fever, and of mercury and iodide of potassium in syphilis, there is no other remedy the beneficial effects of which we can trace with the accuracy of a scientific experiment." In a similar tone many other clinicians express themselves. The writer, however, cannot share this enthusiasm to such a degree. It is true that many chlorotic females show a marked increase in the amount of hæmoglobin when iron is administered. Blaud's pills, containing each two grains of the sulphate of

iron, when given in increasing doses certainly cause a marked increase in some cases. In many others, however, no result worth mentioning is obtained. The writer well remembers the large number of chlorotic patients which A. Robin kept in his wards at the Pitié of Paris, and which he was in the habit of showing to his students as cases in which iron produced no result.

TABLE V.



The broken line shows the more common effect of iron in chlorosis. (Taken from OSLER.)
The dotted line shows the effect of the writer's diet in a case in which no results could be obtained with iron.
The solid line shows the absence of any marked results with iron.
The heavy vertical lines have reference to intervals of one week.

The following two instances may serve as further proof that we are by no means justified in ascribing to iron a specific influence.

M. G., aged fifteen years. The patient's principal complaints are pain in the abdomen after meals, nausea, and slight elevation of temperature. The family history is good. At the age of five years she had a severe attack of scarlatina. In addition she has had the usual diseases of childhood. During the last two years she has been anæmic. The appetite is stated by the mother to be "most delicate." She is inordinately fond of candies. About fifteen minutes after meals she complains of a heavy feeling about the stomach, and, at times, of pain, which may be quite severe, but is relieved by pressure. Several times she has vomited. Quite frequently she has also had headaches. The bowels are fairly regular. There is no cough or expectoration. Once or twice, when in a crowded room, she has fainted. This patient has been treated for chlorosis, and had been taking iron (Blaud's pills) and Gude's pepto-mangan for two years practically without interruption. When first seen she had only 33 per cent. of hæmoglobin. The specific action of iron was certainly not manifest in this case.

E. W., aged seventeen years. This patient had likewise been taking iron, manganese, and arsenic for two years. On her father's side there is a history of tuberculosis; he himself, however, is living and well. On the mother's side the history is good. The patient has not passed through any serious illness, but has, nevertheless, been always ailing and

weakly. The usual chlorotic symptoms are very marked. The hæmoglobin does not exceed 37 per cent.

Every physician who has had occasion to observe a large number of chlorotic patients, and has followed the results of his treatment with the hæmometer, has undoubtedly met with similar cases in which the effect of iron was practically *nil.*

There still remains the fact, however, that iron is certainly beneficial in many instances. How can this be explained? In the opinion of the writer the beneficial effects obtained are simply due to a stimulating effect upon the appetite. The iron itself which is ingested certainly does not serve to increase the amount of hæmoglobin, as it has been shown that practically the total amount ingested is eliminated in the feces.

Numerous observations having shown that iron in the inorganic form frequently produces no satisfactory results in cases of chlorosis, other preparations have been placed upon the market from time to time. Among these may be mentioned ferratin, hæmoglobin, hæmatogen, hæmalbumin, etc. From the writer's observations there can be no doubt that these frequently produce better results than the ordinary inorganic forms of iron, but he also believes that the beneficial effects obtained, where iron in other forms has failed, are largely due to the proteid material which they contain.

During the last three years the writer has been in the habit of treating his cases of chlorosis without drugs, and he claims to have obtained results which at least are as satisfactory as those observed in cases in which iron exhibited its "specific" effect. Starting upon the hypothesis that an insufficient consumption of proteid food must be regarded as the causative factor in the great majority of cases of chlorosis, he has ordered for such patients a diet in which proteid material largely predominated. Before proceeding to detail this diet, it may be mentioned that it has been long known that with a diet composed exclusively of non-nitrogenous food the percentage of hæmoglobin undergoes a notable diminution, while it is augmented by a diet rich in proteids.

The diet which is ordered is given below. Additional instructions, however, are also given: Meals should be taken five times daily, viz., at 8 A.M., 11 A.M., 2 P.M., 5 P.M., and 7 P.M. Rest after meals is insisted upon whenever hyperchlorhydry is found to exist, while moderate exercise is advised whenever hypochlorhydry is found to exist. Ten hours of sleep, warm salt-water baths twice weekly, dry friction in the morning, avoidance of society, etc., are other factors which enter into the plan of treatment.

Diet: Of meats the patient is instructed to indulge liberally in beef and mutton. Raw beef, finely hashed or scraped, is taken once daily, preferably at 11 A.M., on toast or stale bread, with pepper and salt.

The so-called white meats are only exceptionally allowed. At dinner-time the patient also receives from one-half to one ounce of bone-marrow, obtained from the shin-bone of the ox. This should be brought upon the table while hot.

Of vegetables, preference is given to *purées* of peas, beans, and lentils; but green and white vegetables are not excluded. Potatoes are either not given at all, or only once daily, and in small amount.

Of fruits practically all are permissible, with the exception of berries. These may, however, also be given in *purée* form, when deprived of their seeds. Apples are excellent and well borne in most cases.

Of bread, rye-bread is preferred; it should be twenty-four hours old. Toast, Zwieback, and rebaked bread are likewise allowed.

Puddings, pies, pastry, and preserves are interdicted. The same holds good for hot bread, corn-, buckwheat-, and griddle-cakes, and oatmeal.

Coffee and tea are prohibited; milk, buttermilk, cocoa (particularly those forms in which the fat has not been wholly extracted, such as Philips'), and a good quantity of dark beer (Salvator, Pschorr, Würzburger, Klosterbräu, and Bartholomay's Ne Plus Ultra), one pint daily, constitute the beverages which are consumed in addition to one or two pints of water. The writer wishes to insist especially upon the value of dark beer in cases of chlorosis. One pint should be consumed daily; one tumblerful at 11 A.M., with the beef sandwich, and one just before retiring.

With the treatment thus outlined the writer has obtained most satisfactory results in the absence of medication, results, moreover, which compare very favorably with the best that have ever obtained with iron, manganese, and other preparations of a medicinal character.

This treatment is not new, and the writer does not lay claim to any originality in this respect. He simply wishes to emphasize its importance, and believes that we are more entitled to ascribe a specific action to a liberal proteid diet in cases of chlorosis than to iron or any other drug. We can, moreover, trace the beneficial results of this plan of treatment with the accuracy of a scientific experiment.

It is not the writer's intention to insist upon the treatment of every case of chlorosis with beef, bone-marrow, and beer. Among the poorer classes of people who frequent hospital dispensaries such a plan of treatment would be impossible to carry out. Iron may there be prescribed as heretofore. Among the better-to-do classes, on the other hand, the treatment which has been outlined should be invariably instituted whenever a brief course of iron has not led to a satisfactory result. It is useless to drug such patients continually.

In conclusion, a few words regarding the value of bone-marrow in the treatment of chlorosis may not be out of place. As far as the writer has been able to ascertain, the first observations in this direction

were published by Billings,[1] who was led to his investigations by the reports of Fraser,[2] Bigger,[3] and Danforth[4] upon the value of extract of bone-marrow in cases of pernicious anæmia. Billings cites four cases which were thus treated. Two of these were cases of pernicious anæmia, the third a chlorotic girl, and the fourth a "chloro-anæmic" boy.

The bone-marrow was given in the form of a glycerin-extract, which was prepared in the following manner: "Twelve sheep's ribs, carefully scraped, were chopped into small fragments and rubbed up in a mortar with one pound of glycerin. This was allowed to macerate for three or four days, being kept in a refrigerator during that time. It was then strained through gauze and the resultant liquid administered in teaspoonful doses three times a day."[5]

In the chlorotic girl 32 per cent. of hæmoglobin was noted upon admission to the hospital. For the first ten days no treatment was instituted. At the end of this time an increase of 6 per cent. was observed. The extract was then given for sixteen days, when the hæmoglobin amounted to only 40 per cent. In other words, while an increase of 6 per cent. resulted without treatment during the first ten days, a further increase of only 2 per cent. was observed after the patient had taken the extract for sixteen days. This observation is rather unfavorable for the value of red bone-marrow in chlorosis.

In the "chloro-anæmic" boy, on the other hand, an increase of from 35 to 68 per cent. was noted in one month. The administration of Blaud's pills, which was begun at the end of the month, did not, however, lead to a further increase at the end of the next two weeks. The bone-marrow in this case certainly gave more beneficial results than Blaud's pills.

Billings concludes: "The extract of bone-marrow may be of value in cases of ordinary anæmia and chlorosis, such as would be benefited by iron in other forms." He ascribes the benefit obtained in the one case to the iron which the bone-marrow contains.

As has been indicated above, the writer regards bone-marrow as a valuable article of diet in the treatment of chlorosis. Curiously enough, most benefit was obtained with the marrow of the long bones of the ox, of which one to one and a half ounces were administered daily. As the general plan of treatment already described was carried out in almost every instance, it is impossible to determine to what extent the improvement was due to the bone-marrow alone. In only three in-

[1] J. S. Billings: Therapeutic Use of Extract of Bone-marrow. Johns Hopkins Hospital Bulletin, November, 1894.

[2] Fraser: British Medical Journal, June 2, 1894.

[3] Bigger: Lancet, September 22, 1894.

[4] Danforth: Chicago Clinical Review, 1894, vol. iv.

[5] The glycerin-extract may be obtained from the Bureau of Diets, 525 North Charles Street, Baltimore, Md.

stances were the patients permitted to follow their usual mode of living. In these three cases an increase in the amount of hæmoglobin was also noted, but was certainly not so marked as in those in which special stress was laid upon the administration of a large amount of proteid food. On the other hand, it may be said that the increase in the amount of hæmoglobin was more rapid and more marked when bone-marrow also was given.

The writer is not prepared to offer any hypothesis as to the reason why bone-marrow is of value. The fact that practically the same results may be obtained with the yellow marrow of the long bones as with the red marrow certainly speaks against Billings's assumption that the beneficial results which may be obtained are due to the iron which marrow contains.

Abnormalities of "internal secretion" are correctly regarded as the basis of a number of diseases, among which may be mentioned myxœdema, cretinism, Basedow's disease, acromegaly, Addison's disease, pancreatic diabetes, and the affections shown to result from premature loss of the functions of the ovaries and testicles. It would be tempting to view chlorosis in this light. The writer does not feel justified, however, with the data at his disposal, to venture upon such a wide field for speculation.

Conclusions:

1. An anatomical basis of chlorosis has not been satisfactorily determined.

2. A perversion of the appetite—excessive consumption of starches and sugars—is a common symptom of chlorosis.

3. The development of chlorosis is due to an insufficient consumption of animal proteids.

4. Chlorosis is far more common than is generally supposed, and occurs in both sexes and at almost all ages.

5. The diagnosis of chlorosis should be based altogether upon an examination of the blood.

6. The term chlorosis should be discarded, and "simple anæmia" substituted.

7. Iron is not a specific in the treatment of chlorosis.

8. In the treatment of the disease attention should primarily be directed to the diet.

9. In cases in which iron fails satisfactory results may be obtained, without medication, from a suitable diet, in which animal proteids, bone-marrow, and dark beer are the principal factors.

10. The beneficial effects of bone marrow are not due to the amount of iron which it contains.

A CASE OF PUERPERAL SEPTICÆMIA TREATED BY ANTISTREPTOCOCCUS-SERUM.

By Walter Edmunds, M.D.,
of London, England.

Mrs. F. C., aged twenty-six years, was admitted to hospital care April 15, 1896, with the history that she had been confined with her first child on February 2, 1896.

The labor had been difficult, chloroform was administered, and instruments had to be used. About a week later a rigor occurred, others followed, and they continued till her admission in April. There were also fever and pains, first in one joint and then in another.

The treatment had consisted in the administration of quinine and other drugs, curetting of the uterus on one occasion (a few days after the confinement), and the use of antiseptic douches.

On admission on April 15th the patient seemed very seriously ill. Temperature 103.6° F., heavy respirations, and (the day after admission) a rigor; the temperature 104°, the highest taken being 104.8°. There was also swelling of the whole of the left leg, and the ankle-joint was tender and painful on movement, but the knee-joint did not appear to be affected.

The patient was treated daily with subcutaneous injections of a streptococcus-antitoxin, of which the dose was said to be from 2 to 5 c.cm.; the dose given was 4 c.cm. This was continued for six days, and, after missing one day, for two days more. The patient was now much better; there had been no rigor for some days, her strength was better, the respirations less, and the temperature lower. It was thought that the injections might now be stopped, and this was desirable on account of the great swelling, redness, and local pain caused by them. Three days later—*i.e.*, on the third day without the antitoxin—the left knee became painful and swollen. The antitoxin-injections were resumed, and on this and the next two days there were slight rigors. The treatment was continued for six days, when it was stopped, mainly on account of the irritation it produced. For four days the temperature continued low, but on the fifth day there was chilliness and a rise to 102.4°. On the seventh day, May 9th, the patient was so weak and ill that it was decided to try antitoxin again, and accordingly 20 c.cm. of an antitoxin obtained from a different source was administered. This was followed by a fall of the temperature. which became and remained nearly normal for the next few days, and the patient's condition generally also improved. No more antitoxin was given. On May 19th a small abscess in connection with the left ankle-joint was opened. It was quite subcutaneous; no anæsthetic was necessary and no drainage-tube was inserted. The abscess healed in a few days.

Patient continued to do well with about normal temperature, but on May 30th there was fairly distinct evidence of pus in the left knee-joint. An anæsthetic was administered, two incisions made, and a drainage-tube inserted. The pus from this abscess was examined. No growth of micro-organisms occurred from it in a gelatin-tube, but under the microscope it was seen to contain typical strings of streptococcus.

The drainage-tube was removed from the knee and the wounds healed. The patient continued to make good progress, and the temperature remained satisfactory till August 17th, when it rose to 102.4° and the patient felt chilly. The next day an injection of 10 c.cm. of an antitoxin from a third source was administered. This was followed by a fall of the temperature to about normal, and no further symptoms showed themselves. The patient is now (November) practically well, but the left knee is quite stiff, the movement of the left ankle-joint much limited, and there is also some limitation of the movement of the lower jaw, so that the mouth cannot be opened wide.

This case is free from two fallacies which sometimes interfere with judging of the effect of the antitoxin treatment. In the first place, it was a case of streptococcus infection shown by the examination of the pus from the knee; secondly, surgical treatment was not had recourse to at the same time as the administration of the antitoxin. The abscesses were not opened till long after the injections had been commenced and great improvement had already occurred.

At the time of admission the patient was so ill that it was thought doubtful whether she would recover. After a few days with the antitoxin treatment she was much better, the temperature lower, and the respirations much less. After the injections had been stopped two days the knee became affected (or, if previously affected, worse). The injections were used for six days; then, again, after an interval of six days without them, the patient was very ill and improved after a single injection.

Finally, the failure of the streptococci in the pus from the knee to grow may no doubt have been due to other causes than their having been killed or inhibited by the antitoxin; but it is quite possible that this was the cause.

My own belief is that the antitoxin saved the patient's life.

The injections produced, in varying degree, pain, erythema, and, on four occasions, an abscess. This may have been in part due to some decomposition having occurred in the serum after the bottle was opened, although much care was taken. It is desirable that the serum should be supplied in single-dose bottles. On one occasion the antitoxin was tested by us before use and found sterile, yet its injection was followed by an abscess. It must be remembered that in some of these cases large subcutaneous abscesses occur spontaneously, and that in this case suppuration occurred spontaneously in the knee and ankle.

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IDIOPATHIC OSTEOPSATHYROSIS (FRAGILITAS OSSIUM) IN INFANCY AND CHILDHOOD.

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Except in old persons fragilitas ossium, or osteopsathyrosis, as it was first called by Lobstein (*Traité d'Anatom. Patholog.*, 1833, T. ii. 204), is a condition comparatively so uncommon that it receives but little attention from most writers of text-books, and that instances of it are always of interest. Even special articles of value upon the subject are few in number. The most exhaustive and satisfactory is the classical contribution by Gurlt (*Handbuch der Knochenbrüche*, 1862, Theil. i. 147), which contains a number of cases cited from medical literature. Among other writers Volkmann (Pitha-Billroth; *Handb. d. allg. u. spec. Chirurg.*, 1865, B. ii., Abt. ii., Hlft. i. 365) gives a short but very useful review of the subject. Enderlen (*Arch. f. pathol. Anat.*, 1893, cxxxi. 223) collects a few cases additional to those of Gurlt, and the article by Linck (*Arch. f. Gynäkol.*, 1887, xxx. 264) is of value. More recently Schultze (*Arch. f. klin Chirurg.*, 1894, xlvii. 327) and Moreau (*Contribution a l'étude de la fragilité des os.* Paris, 1894) have written regarding it, limiting themselves largely to the idiopathic form. Simon (*Des fractures spontanées*, Paris, 1886) and Dubrueil (*Étude critique sur les fractures spontanées*, Paris, 1891) have discussed it in theses upon spontaneous fractures.

Several varieties of osteopsathyrosis may be distinguished. Thus we may have it either symptomatic to other affections or occurring idiopathically—*i. e.*, not associated with any discoverable cause. The symptomatic form depends upon various conditions. For instance, rhachitis is capable in many instances of occasioning actual transverse fracture, as well as great bending of the bones. Osteomalacia likewise may produce fractures, and sometimes to such an extent that an *osteomalacia fracturosa* (Kilian) has been described. Cases of fragilitas due to scurvy have also been reported, and it is possible that some of the instances of brittle bones in infants may be attributable to it. Syphilis has long been considered a cause of osteopsathyrosis. It is a disputed point whether congenital syphilis may occasion a general brittleness of the whole of the osseous system, depending upon some unrecognizable change in the structure of the bone, or whether the fractures are always the result of localized gummatous processes. The studies of cases by Gangolphe (*Malad. infec. et parasit. des os*, 1894) failed to show any instances of fragility of bone in congenital syphilis independent of local lesions, and Volk-

mann believes that syphilitic fractures are the result of a gummatous osteitis. There certainly seem to be good grounds for believing that at least most of the cases of fragilitas attributed to the general effect of syphilis are so attributed without good reason. Simon believes that both hereditary syphilis and scorbutus are more apt to occasion separation of the epiphyses.

There are, further, a whole series of causes which probably produce atrophy of the bone and consequent fragility. Many of these are of a distinctly nervous nature. Thus we find fragility sometimes developing in locomotor ataxia, poliomyelitis, and mental diseases. There are also atrophic changes resulting from simple inactivity, and those commonly attending old age. There is some question, however, whether the fractures which so often and so easily occur in old persons depend always on fragilitis, or whether they are not in many cases brought about by the diminished power old persons have of guarding themselves against falls and other accidents capable of producing fractures.

Finally, there is a series of local causes for fragilitas, among them osteomyelitis, carcinoma or other malignant growth of the bone, gummata, echinococcus or other cysts, and localized necrosis.

It is, however, only with idiopathic osteopsathyrosis that we have to do in this connection, and, to narrow it still more, only with those cases in which the disease begins in infancy or childhood. The following case is a remarkable instance of the very early, almost congenital presence of the disease. I saw the child with Dr. B. H. Detwiler, of Williamsport, Pa., to whom I am indebted for the facts of the clinical history:

H. E., male, aged two years and ten months. The family history is good, both parents and grandparents being unusually healthy people. The only exception is that a brother of the mother had never been able to walk, and died at the age of six years. His affection, however, seems to have been rather a mental one than any involvement of the bones. A brother of the patient died when five months old, apparently through the effect of heat. The patient, who is the second and only other child, was born July 11, 1893. Labor was not protracted nor severe. Nothing unusual was noticed until the second day after birth, when it was found that the right femur was fractured, and, on further examination under an anæsthetic, the left femur was also found to be broken in its neck. Both limbs were placed in long splints and dressed with a silicate of soda bandage. In three weeks the dressings were removed and union was found complete. On September 11th, at the age of three months, the right humerus and right femur were broken. The accident appears to have been the result of a medical examination, since the boy cried as though in pain while it was going on. As the examination was made with due gentleness this shows the exceeding brittleness of the bones. Both bones united nicely. On March 1, 1894, he was sitting in his chair, lost his balance and fell forward, but not out of the chair, producing a fracture of the right femur near the hip. On September 11,

1894, just a year after the former accident, he broke his left thigh again. Union took place, but in October, two weeks after the dressings had been removed, the bone was fractured again. This time it was kept in splints four or five weeks. When examined during anæsthesia the femora appeared to be abnormally thin. In the spring of 1895 he fell out of his hammock and broke both his thighs. Union took place well. Three months later he broke his right thigh.

Besides these fractures there were times when he appeared to be having pain in various parts of the body, supposed to be rheumatic, but which was undoubtedly due to undiscovered fractures, since at least one fracture of the left thigh and one of the right forearm, both of which united with angular union, were found afterward. On several occasions he has broken his ribs. It is estimated that he has had in all 17 or 18 fractures, and he certainly has had 12. The fractures have always been attended by pain, but do not appear to have been preceded by it. Union has always been prompt. The child was nursed until the age of five months After that he was fed with cow's milk and later with nourishment suitable to his age. The general health and nutrition are good. The appetite is good, and there have been but slight digestive disturbances. He is carried constantly upon a stretcher, lest sitting him up should produce fracture.

I saw him for the first time December 3, 1895. Examination was difficult, owing to the great terror which the child had of doctors, and the danger of fracture which handling entailed. He was a plump, apparently well-developed and healthy-looking boy, lying comfortably on his back on a stretcher. The head was decidedly larger than normal. The frontal bones had distinct bosses suggesting rickets, and the back of the head was flattened, doubtless from the long-continued pressure caused by the enforced position. There were no other evidences of possible rickets connected with it. The chest was of normal shape and there was no beading of the ribs. There were no enlargements of the epiphyses of the long bones. The right arm had a bad angular deformity shortly above the wrist, and the left thigh was similarly deformed at the upper third, with eversion of the foot. Curvature of the bones in any part of the body could not be detected. The muscles of the calves were well developed, but the thighs were flabby. The arms were well developed. He had been taking cod-liver oil for some time. I advised that he be carefully accustomed to sit up in order to give his muscles the needed exercise.

I saw him for the second time in April, 1896. He had improved greatly. He could now turn himself over and move his legs freely, and could sit upright in the lap, although he needed support. The muscles were evidently gaining strength rapidly. His general condition was excellent. His head, however, seemed even larger than at the first examination, although not hydrocephalic in appearance nor of rickety shape. It seemed, in fact, simply to be an unusually large head for his size. There had now been no fractures since the preceding summer, and the fragility seemed evidently less. I advised the use of phosphorus in addition to the cod-liver oil, and that he have plenty of fresh air and all the exercise he could be made to take with safety to his limbs. I could not obtain a specimen of urine.

I have looked somewhat extensively through medical literature in search of cases of idiopathic osteopsathyrosis in childhood, in the effort

to learn what light the experience of others might throw upon the cause, nature, and treatment of this strange affection. There have been but few cases reported with a degree of brittleness greater than, or even as great as, that shown by the case just detailed; and even instances with a less, although still decided, brittleness, with the occurrence of multiple fractures, have not been common. The list which follows is the result of the search. Cases have been excluded in which the disease appeared to have commenced after puberty, and most of those also in which but one or two bones were fractured apparently from slight causes. Those cases, too, have been omitted in which it seemed certain from the other symptoms or from the post-mortem examination that the undoubted fragility was secondary to some other disease. Instances of multiple intrauterine fracture, in which it seemed likely that accidents happening during pregnancy were sufficient to account for the lesions, have also been rejected. On the other hand, a number of doubtful cases have been included, although with explanatory remarks to indicate the uncertainty. The observations are not arranged in any alphabetical or chronological order.

A. CASES SHOWING DIRECT INHERITANCE.

The influence of inheritance has been very marked in a number of instances, the disease having appeared in the parents or grandparents, and perhaps affecting several children of the family. The following cases represent this direct inheritance:

I. Greenish (*Brit. Med. Journ.*, 1880, i. 967). In a family the grandfather, A., had been an invalid on account of multiple fractures. He had three sons and two daughters. The daughters and one son had no fractures, but of the remaining two sons one, B., had suffered 1 fracture, and of his children one son had 13 fractures by the age of nineteen years, the first break occurring when very young. Most of the fractures healed promptly, but some were very slow. Another son had 2 fractures, the result of a severe accident. One other son and two daughters escaped accident. A.'s other son, C., had 2 fractures, and of his children one son had 8 fractures, one son 3, three sons each 4, and one daughter 3 fractures. Four other daughters escaped accident. The cause of the fractures was usually slight.

II. Pauli (*Unters. u. Erfahrung. im Gebiete der Chir.*, 1844, 35. Quoted in *Dublin Hosp. Gaz.*, February 1, 1846, 189). The members of a family otherwise healthy had all had fractures; three of them had 2 each, one 3, and one 5 fractures. No considerable violence was required. No fracture occurred before the age of eight years. All healed with unusual rapidity. A second break never took place in the seat of a former one. Both the father and grandfather had been liable to fractures.

III. Willard (*Med. News*, 1887, ii. 734). The father and mother showed no evidence of syphilis and denied having had it. The children were small, puny, and had notched teeth, and some were almost dwarfs.

The father had 3 fractures, all from direct violence. One daughter, eighteen years old, had 9 fractures by the age of twelve years, the first occurring at twelve months. One daughter had 5 fractures by the age of sixteen years, the first at four years. One daughter, aged eighteen years, had 3 fractures by the age of twenty-two months, but none since. The first was at eight weeks. One son had 4 fractures by the age of eight years, the first being at two years. One daughter fractured her left clavicle at birth, during an easy labor, and fractured it again at thirteen months. One daughter fractured her right clavicle at the age of one week. One daughter fractured her left clavicle at the age of three weeeks. One son fractured a rib at seven years of age. A grandchild, the child of one of the affected daughters, broke its thigh at the age of four weeks, and broke it again at nine months.

Nearly always the fractures resulted from some insignificant cause. Union was usually speedy. In the femora the fractures were nearly always in the line of the callus.

In this case the presence of fragility in the father is doubtful, but its inheritance by the grandchild is undoubted.

The following instance of fragility is so interesting on account of the remarkable inheritance that I include it, although there is strong doubt upon the propriety of calling the osteopsathyrosis idiopathic:

IV. Ekmann (*Dissertatio medica descriptionem et casus aliquot osteomalaciæ sistens.* Upsaliæ, 1788. Quoted by Gurlt, *loc. cit.*, 148). The great-grandfather, A., had limbs so deformed that he could not walk. In the next generation one son, $B._1$, lost all strength in the arms and legs at the time of puberty. One daughter, $B._2$, was small and deformed and waddled. One son, $B._3$, was a dwarf and had a decided bend of the arms and legs. In the third generation—the children of $B._3$—there was one son, C., who experienced fractures from the slightest causes from earliest infancy. His limbs were bent and he was unable to walk. In the fourth generation—the children of C.—one son, $D._1$, when scarcely a month old, had his arms and legs so soft that they bent with the slightest touch, and later fractured three or four times in every year of his childhood. One daughter, $D._2$, had a fracture when eight days old, without the action of any discoverable force, and later, during childhood, suffered fractures from the slightest causes.

It would seem that the ancestor of this family was deformed, but whether from bending or breaking is not stated. The next generation showed softening of bone apparently without fracture. The next showed remarkable fragility which seemed far to exceed the softening. The last generation exhibited great softening with fragility in one case, and seemingly fragility alone in the other.

V. Goddard (personal communication to Gibson. *Instit. and Pract. of Surgery*, 1850, 8th ed., i. 236). A boy of thirteen years had 14 fractures, all from very slight causes, and all healing promptly. Four of them occurred by the age of four years. His mother had had 6 fractures and her brother 13 (11 in thighs and 2 in arms) up to the age of thirteen years.

VI. Hamilton (case reported by Armenag Assadoorian). (*Physician and Pharmacist*, February, 1870.) A man of fifty-three years broke the left elbow when a child, and two years later the right elbow. No union took place. Some time later he broke the left clavicle. In all he had 11 fractures and 2 dislocations. With regard to one accident it is stated that union was slow. His father broke both forearms at the elbow. Two paternal uncles each broke a leg and one of them an arm. A sister had one fracture, and she or another sister had another. A brother had 5 fractures and 1 dislocation.

VII. Graham (*Boston Med. and Surg. Journ.*, 1884, cx. 467). A man [it would seem of thirty-two or thirty-three years of age] had his first fracture at eighteen months. He continued to have them at frequent intervals, and had in all 18 fractures by the age of eighteen years, but none since. His father had 14 fractures, and a cousin of his father 21. The father's paternal uncle also was a bone-breaker.

VIII. Cox (*Eclect. Med. Journ.*, Cincinnati, 1879, xxxix. 458). A girl of eighteen years had never been able to walk [presumably from early fractures]. Her lower extremities were greatly deformed and she had in all 7 fractures, 5 of them of the femur. The brother of thirteen years had never been able to walk [but it is not stated whether there had been fractures]. The father and several of his brothers had bones easily broken.

IX. Hiester (*Boston Med. and Surg. Journ.*, 1849, xli. 393). A well-developed girl of sixteen years fractured her leg in going upstairs. This was her 3d fracture. [The age when the others occurred is not stated.] Three other children of the family had 8, 7, and 3 fractures, respectively. The maternal grandfather had 4 or 5 fractures.

X. Battles (personal communication to Gross. *System of Surgery*, 1882, 6th ed., vol. i. 871). Of eleven children five, all males, had fragility of the bones. One of them, aged twenty-four years, had 64 fractures; the next had 34; the third child, aged thirteen years, had 30; the fourth, aged eleven years, had 10; the fifth, aged two years, had 2. All were situated in the thighs, occurred usually from slight causes, and united promptly. No severe pain was experienced. The six daughters resembled the father in appearance, but the five sons looked like the mother, through whom the fragility seemed to be inherited; her father and several of her brothers and sisters had brittleness of the bones.

The following instance is a doubtful one, since the "fractures" may have been but separations of the epiphyses:

XI. Atherton (*Dominion Med. Monthly*, 1894, ii. 1). A boy of thirteen years fractured his olecranon twice on each side, making 4 fractures in all. There was a tendency in the family to fractures from slight causes. The paternal grandfather had 3 or 4 fractures, and the paternal grandmother very frequent fractures. The father had at least 6 fractures, and the paternal uncles had broken their bones. The patient had two sisters, both of whom escaped.

B. CASES SHOWING A FAMILY PREDISPOSITION.

There are other cases than those detailed in which no direct inheritance is reported, yet in which there is a striking family history, more than one child being the subject of the disease, or perhaps other relatives

suffering from it. The cases of this nature which I have been able to find are as follows:

XII. Pritchard (*Lancet*, 1883, ii. 394). A male child, apparently healthy, fractured both humerus and femur without history of accident two days after birth; on the next day broke the other humerus through being moved in bed; and in three weeks broke the other femur. All united promptly. The father was one of eight children, two of whom had fractures in infancy. The only brother of the father had four children, three of whom had fractures apparently spontaneously soon after birth.

The case reported by Pritchard shows a remarkable degree of indirect inheritance. It is not stated that the fathers themselves suffered fractures.

XIII. Axmann (*Ann. f. d. ges. Heilk.*, 1831, iv. 58. Quoted by Gurlt, *loc. cit.*, 149). The writer gives his own family history. He and his two brothers were of rather delicate build. He had a fracture of the leg in his third year; one brother had 4 fractures from the age of two to that of nineteen years, 3 of them occurring before six years of age. The other brother had 9 fractures from the age of two to that of nineteen years, 4 of them before he was five years old. These 14 fractures occurred without the action of noteworthy force. All healed in four or five weeks. The fragility decreased with growth and disappeared at maturity.

This case is doubtless the same as that referred to by Lobstein (*loc. cit.*) and reported by Strack (*Neues Journ. d. pract. Arzneyk. u. Wundarzneyk.*, 1806, xxv., 3 St., 163), and, according to Gurlt, is probably the same as that described by Renard (*Versuch ü. die Entstehung u. Ernährung des Knochen*, Leipzig, 1803). I have not been able to obtain the original. It seems very possibly, too, identical with that reported by Mebes, and presently to be detailed (XVIII.).

XIV. Arnott (*London Med. Gazette*, 1833, xii. 366). A girl of fourteen years, a patient at the Middlesex Hospital, suffered her first fracture at the age of three years, and had in all 31 fractures, viz, thighs 13, legs 10, arms 7, forearm 1. Slight falls, or even turning around suddenly, were sufficient to cause them. Union was always complete and remarkably prompt. A sister of six years had 9 fractures, the first at eight months. The general health of both girls was excellent. Two brothers and one sister were unaffected.

XV. Agnew (*Princip. and Pract. of Surgery*, 1878, vol. i. 918). A child of three years with a fracture of the thigh had broken the same bone the year before. Five other children in the family had each had fractures of some part of the skeleton, two of them each 3 times, and one, an infant of three weeks, having had a rib broken by being turned in the nurse's arms. The author believes that a syphilitic taint in the father was the cause of the fragility. [However, no evidences of the existence of syphilis in the children are mentioned.]

XVI. Moreau (*Contribution a l'étude de la fragilité constitutionelle des os.* Thèse de Paris, 1894). A girl, aged twelve years, broke her leg at

the age of five years, and had 7 fractures within four years and ten months. All but one were in the legs. Her sister, aged nine years, broke her leg at the age of five years, and had 10 fractures within two years and eight months. All but two were in the legs. All the fractures in these two cases were produced by insignificant causes and all healed promptly. The children were apparently healthy, without history of syphilis or rickets. The father died of progressive paralysis. The mother had by her first husband two children unaffected by the disease.

XVII. Jones (*Medical Archives*, St. Louis, 1866, iii. 127). A man of twenty-four years, of excellent general health. At the age of three years he broke both legs as the result of a slight fall. Since then there had been numerous fractures, about 50 in all, chiefly in the lower extremities. The slightest fall would be sufficient to cause them. Little pain attended and union was rapid. Great deformity finally resulted, making the patient unable to walk. A cousin, the niece of his father, had been afflicted in a similar manner, and had numerous fractures.

XVIII. Mebes (*Die Knochenbrüche, etc.*, 1845, 35). This writer states that among other instances of the affection he knows of a family in which three children had broken legs and arms 8 times within five years.

This brief note corresponds so closely in the number of cases and in the age with the account given by Strack (*loc. cit.*) of the early history of the Axmann family (see XIII.), that it seems very possible that the cases are identical.

C. ISOLATED CASES.

There are a considerable number of cases reported in which no history is given of inheritance of the malady or of family predisposition. I have been able to find the following instances:

XIX. Blanchard (*Chicago Med. Journ. and Exam.*, 1876, xxxiii. 7). Later and more completely in *Transac. Amer. Orthop. Assoc.*, 1893, vi. 83). A woman, aged twenty-seven years, experienced her first fracture at the age of two months. Up to the age of nine years, when first reported, she had 41 fractures. At twenty-seven years she was unable to walk and had about 106 fractures. Her own weight was sufficient to break her legs, and she frequently had produced fractures by turning in bed. Not much inflammation or pain attended them and no pain preceded. Union was remarkably tedious, for when dressings were removed at the end of the second or third month the bone was still pliable, and angular bending would begin and continue until more than a year after the accident. Great deformity finally ensued.

XX. Blanchard (case of Frankenthal). (*Transac. Amer. Orthop. Assoc.*, 1895, viii. 275.) A woman of twenty-nine years, who commenced to have fractures in the second year of life. Up to the time when reported she had 17 fractures of the long bones and 2 dislocations. There was but slight pain or inflammation with the accidents. Union was very tedious. At the end of two or three months it was not firmer than rubber, and two or three years passed before it was completely firm. Dressings were usually removed after two or three months, and angular curvature then commenced and increased until the end of one or two years.

XXI. Blanchard (*ibid.*). A girl of four years fractured her right femur when two years old, by falling from a chair. It was neglected, and angular deformity resulted. About six months later she broke her left femur through a very slight fall, and again in six months broke it in another place. Union was prompt and perfect in the last two fractures.

XXII. Fleming (*Edinb. Med. Journ.*, 1862, viii. 24). A man of twenty-four years had his first fracture, the thigh, when eighteen months old, and since then had in all 53 fractures, viz., thighs 35, ribs 8, forearms 5, jaw 1, fingers 4. The simplest causes were sufficient. Union was remarkably prompt in the fracture under observation—the last one.

XXIII. Gibson (*Instit. and Pract. of Surgery*, 1850, 8th ed., vol. i. 234). A man of twenty-two years, previously of excellent health, had extraordinary brittleness of the bones from infancy, and had suffered in all 24 fractures from the slightest causes, such as tripping over a rug, walking, etc. Union was prompt and without much deformity.

XXIV. Velpeau (*Gaz. des Hôpitaux*, 1847, 2 ser., ix. 265). A girl of excellent general health had her first fracture at the age of fourteen months, and before the age of fifteen years had 6 fractures—thigh 5, arm 1. All resulted from very slight causes, twice while merely walking. The last fracture united slowly. She had also had 3 dislocations.

XXV. Earle (quoted by Stanley, *Diseases of the Bones*, 1849, 195). A boy of ten years had 8 fractures—6 in one tibia and 2 in one femur—each in a different part of the bone from the preceding ones. All united within the usual time.

XXVI. Mettauer (personal communication to Gibson, *Institutes and Practice of Surgery*, 1850, 8th ed., vol. i. 235). A man of seventy years had been subject to fractures from earliest infancy. The tendency to fracture had seemed to increase with age. The slightest cause was sufficient, such as mounting a horse, a sudden twist of the body, etc. Recovery was always astonishingly speedy.

XXVII. Corson (*The Clinic*, Cincinnati, 1873, iv. 157). A well-developed infant cried for five hours after a difficult birth. On the eleventh day a fracture of the thigh was discovered, and nine days later the other thigh was fractured, two days later still the humerus broke, and at this time callus was discovered on the radius and ulna.

XXVIII. Langton (*Brit. Med. Journ.*, 1895, ii. 1234). A girl had been by the age of eleven years the subject of several spontaneous fractures as the result of muscular action or very slight injury. All united but one, which had been roughly treated. In this one union was never firm. Subsequently two fractures which had been firm parted again, and in one of them a sarcoma developed by the age of twenty-three years.

XXIX. Houston (*Dublin Journ. Med. and Chem. Sciences*, 1836, viii. 474). A well-developed boy of five years had his first fracture at three years. Within two years he broke each tibia and each femur once. The cause was always inconsiderable, and the fractures always occurred while running. Union was always prompt.

XXX. Schultze (*Arch. f. klin. Chirurg.*, 1894, xlvii. 327). A girl, thirteen years old, was weak when born, but later grew well and strong. She had her first fracture, the right femur, at nine months. At one and a half years of age the same place broke again. Up to six years of age she had 5 more fractures without any trace of bending, and by her

thirteenth year she had not less than 30, viz., right thigh 7, left thigh 5, right leg 6, left leg 4, right arm 2, left arm 4, right forearm 2. All were produced by the slightest causes. Pain was nearly absent in fractures of the upper extremity, but present in those of the lower. Union took place in a shorter time than in normal bone. Great bending and twisting of the lower extremities finally developed. Operation showed the tibiæ to be much flattened, and with the marrow-cavity of the right tibia scarcely visible and no trace of it in the left. The right tibia and fibula were united by a flattened exostosis.

XXXI. Linck (*Archiv f. Gynäkol.*, 1887, xxx. 264). No history of accident to or disease of the mother. Labor was easy. A premature child which died shortly after birth. There were fresh fractures and old healed and unhealed fractures of all the ribs—40 on the left side and 44 on the right—which had caused numerous nodules and bendings; 10 fractures of the extremities—6 of them fresh—and united and recent fractures of the clavicles. No enlargement of the epiphyses or of the junction of the ribs and cartilages was anywhere found. The microscopical examination showed the bones to be practically normal.

XXXII. Parker (*New York Med. Journ.*, 1852, n. s., ix. 96). A girl of eleven years, previously in poor health, had her first fracture—of the tibia—at the age of six years. Five months later she broke her right thigh, and when about ten years old her clavicle. The cause was always insignificant, and union was always prompt.

XXXIII. Howell (*Atlanta Med. and Surg. Journ.*, 1884, xxv. 82). A healthy man of twenty-eight years had his first fracture—the left thigh—in his second year, through falling from a chair. A few years later he broke the right thigh. By the age of twelve years he had broken his right thigh 3 times and his left thigh 2 times, and a year or two later he broke his left thigh again. The 7th fracture was of the right thigh in his sixteenth year, and the last fracture was of the left thigh at twenty-eight years. The last united slowly.

The following cases are even more briefly described by those reporting them than are some of the last:

XXXIV. Tamplin (*Lectures on the Nature and Treatment of Deformities*, 1846, 234). A girl of seventeen years, of unhealthy appearance and pallid, had about 40 fractures produced by walking or other slight cause. [The age when the disease began is not stated.]

XXXV. Dawson. According to Corson (*The Clinic*, Cincinnati, 1873, iv. 157), W. W. Dawson "presented at one of his clinics" a child of three years who had suffered more than a score of fractures. The readiness with which the bones united was one of the most prominent features.

XXXVI. Willett (*Brit. Med. Journ.*, 1895, ii. 1235) states that he remembered a child who had broken 6 of its long bones, only one of the fractures showing any signs of callus.

XXXVII. Ridd (*Schmidt's Jahrbücher*, Jahrg., 1868, Bd. ii. 631). [This is the reference given by Linck, but I have not succeeded in verifying it, and there seems to be some mistake in it.] A healthy mother had a premature child which lived nine days and died suddenly in a convulsion. The autopsy revealed 54 fractures, partly recent, partly united by callus.

XXXVIII. Ketch (*Trans. Amer. Orthop. Assoc.*, 1893, vi. 86) saw a child some years ago in a public clinic in New York who would have a fracture on turning in bed. [I have been unable to learn anything further about this case.]

XXXIX. Hoadley (*Trans. Amer. Orthop. Assoc.*, 1893, vi 85) says that Bond showed a case of fragilitas twenty years ago in the Chicago Medical College. The child [sex not stated] was about twelve years old, and there had been about 119 fractures. The bones are said to have been soft in the earlier stages. The fractures united with great facility. [I have been unable to discover where the case was first reported.]

XL. D'Outrepont (*Abhandlungen u. Beiträge geburtshülflichen Inhalts.* Th. 1, Bamberg u. Würzburg, 1822, 228; quoted by Gurlt, *loc. cit.*, 225). A stillborn child exhibited signs of fracture of the right thigh, both upper arms, and the left clavicle. Callus, which seemed probably to be recently formed, was found on the bones at the autopsy.

XLI. D'Outrepont (*ibid.*, 233; quoted by Gurlt, *ibid.*, 225). A child, after an easy labor, was found to have fractures of the left femur, right humerus, right clavicle, and two ribs. No cause was discovered. The child recovered.

XLII. Wight (*Annals of Surgery*, 1893, xviii. 662). A boy of eighteen years had great deformity of the legs and thighs from angular union of fractures. The father stated that his son had always been subject to poor health, and that he had had fits, and that this was the cause of the crooked bones. [Apparently the deformity was the result of frequent fractures of the fragile bones caused by muscular action during the fits. The age when the convulsions began is not stated.]

D. ISOLATED CASES WITH SOME ELEMENT OF DOUBT.

The following instances of the disease, occurring in a single individual of a family, have some element of doubt attached to them as regards their belonging strictly to the class of idiopathic osteopsathyrosis. In some of them the writer mentions the existence of rickets, although it is not convincing in every instance that this disease had been present; for the old writers, and many more recent ones as well, were disposed to attribute all cases of early fragilitas to rickets as a matter of course. In other cases rickets certainly had existed at one time, but the fragilitas showed itself at a period when rickets must have ceased to be active. It does not seem at all clear that the two conditions were at all interdependent in these cases.

In other instances we have to do with cases which resembled in some particulars the so-called fœtal rickets, but in which there was a degree of fragility by no means corresponding with that usually seen in this condition. Finally, we have certain intrauterine cases where the fractured or membranous condition of the bones of the cranium, or the very great number of fractures occurring widespread in fœtal life, led to the suspicion that the cause may have been an insufficient advancement of the ossifying process. Such a condition is, however, a very obscure one, and does not satisfactorily explain the fragility. I have, therefore, pro-

visionally included these cases with the others as instances of idiopathic osteopsathyrosis. Although there is a history of accident to the mother during pregnancy mentioned in some instances, it does not seem sufficient in the cases I have selected to account for the fractures.

XLIII. Jacquinelle (*Journ. de Médec., Chirurg., Pharm., etc.*, 1788, lxxvii. 267, and 1790, lxxxiv. 216). A man of thirty-two years undoubtedly had rickets severely as an infant, and could not walk until five years old. He was then fairly well until twelve years old, when he had his first fracture, one of the arm. He had a fracture of both thighs at fifteen years, and one of the arm two years later. In all he had 6 fractures. The degree of force required was inconsiderable. Union was prompt and complete.

XLIV. Lonsdale (*A Practical Treatise on Fractures*, 1838, 21). A girl in whom there had been 22 fractures from the most trivial causes. Most of the bones were rickety. Union took place in the usual time. [The age of the girl is not stated, nor is the evidence of rickets explained. From the context it appears that there was no bending of the bones in this case.]

XLV. Barwell (*Brit. Med. Journ.*, 1882, ii. 1155). A girl of seventeen years, with great bending and deformity of the bones of the extremities, but with no bending of the ribs nor enlargement of the epiphyses. Between the ages of nine and thirteen years she broke her arm 4 times and her ribs on several occasions. He describes the case as rhachitic osteomalacia, stating that it was neither rickets nor osteomalacia. [The late development and the absence of positive signs of rickets make it probable that this is an instance of idiopathic osteopsathyrosis.]

XLVI. Lange (Günsburg's *Zeitsch. f. klin. Medizin*, 1852, iii. 263). A girl of eleven years, of scrofulous habitus and with pigeon breast, had in all 6 fractures. Two years later she had her 7th fracture. [Nothing is said as to the age when the first fracture occurred, nor is there anything to suggest rickets unless it is the pigeon breast.]

XLVII. Esquirol (quoted by Malgaigne, *A Treatise on Fractures*, Amer. ed., 33) had in his collection the skeleton of a rhachitic female in which nearly all the long bones were broken, and more than 200 fractures could be counted. [Nothing is said of the age, but it is safe to presume that with such numerous fractures the disease must have been present in childhood, and that something more than rickets was present.]

XLVIII. Malgaigne (*A Treatise on Fractures*, Amer. ed., 33) says that in the Musée Dupuytren is a skeleton of a child, of six or seven years, with general rhachitis and with 12 fractures.

XLIX. Malgaigne (*ibid.*, 31). A boy of ten years, who had been badly rhachitic in early infancy and whose legs and arms were distorted by the disease. His first fracture occurred at the age of six years, and he had 4 by ten years. No special force was required. All healed well.

L. Chaussier (*Bull. de la Fac. de Méd. de Paris*, 1814, iii. 306). A female child, dying twenty-four hours after an easy labor. The long bones of the extremities were shorter and thicker than normal and more or less curved. There were found 113 complete fractures, some of them united, some still yielding to bending and with crepitation, and with the periosteum in these places much thickened. The ribs alone had 70 fractures.

LI. Barker (*Brit. Med. Journ.*, 1857, ii. 806, 823). A female child, dying ten minutes after birth, which had not been difficult. The mother had repeatedly had falls on a flight of stone steps. The examination of the child showed an entire absence of bone in the covering of the brain, and numerous fractures of both the upper and lower extremities. The bones were remarkably brittle, the merest pressure snapping the ribs like glass. Chemical examination of the bones showed too small a proportion of inorganic material—33.34 per cent. The writer believes that arrest of development did not account for the fragility, since the fractures were situated where ossification had advanced the most.

LII. Hirschfeld (*Gaz. des Hôpitaux*, 1857, 291). A seven months' male fœtus, born dead. The mother had had a fall. The fœtus showed no evidence of rickets. The vault of the skull seemed made only of minute thin plates of bone. The long bones of the extremities, the ribs, and the clavicles exhibited a number of fractures, certainly over 20.

LIII. Vrolik (*Tabulæ ad illustrandam embryogenesin hominis et mam malium*, 1849, Fol. Tab. 91, Fig. 1, 2; quoted by Linck, *loc. cit.*). A child which died three days after birth. The parents had been syphilitic, but the mother bore an entirely healthy child the next year. The skull was hydrocephalic, and, when skeletonized, was found to consist largely of a great number of irregular pieces of bone, suggesting Wormian bones. The extremities and the ribs exhibited numerous fractures, some fresh, some united by callus.

LIV. Dupuytren (*Bull. de la Fac. de Méd. de Paris*, 1811, ii. 154.) A little girl, very delicate, and with a weakly mother. At the age of two months she had her first fracture—the arm—without known cause, and two months later she broke the left thigh while lying down. At eight months of age she broke the right thigh. This last was preceded by a curvature of the limb. At two years and four months the right thigh appeared to be giving way, and after some days it broke as the result of a fall. Then the earlier of the old fractures softened and the bones became bent.

LV. Dubrueil (*Étude critique sur les fractures spontanées*, Paris, 1891). A boy of ten years, of a healthy father but rhachitic mother, had his legs bent in infancy by rhachitis. He suffered his first fracture—the humerus—at six years, and had 4 fractures by the age of ten years. The cause was slight in all; there was not much pain, and union was not delayed.

LVI. Cecconi (*Giornale dell. soc. med. chir. di Parma;* quoted in Hufeland's *Journ. der pract. Arzneyk*, 1816, xlii. St. 4, 124). A child dying seven hours after an easy birth. All the epiphyses had been broken "in the direction of their length." The shoulder-blades were the only ones spared. Crepitation could be heard and felt. No history of accident to the mother. [It is not clear from the description whether or not this is an instance of separation of epiphyses, but it would seem not. I have not been able to obtain the Italian original.]

LVII. Schroeder (*Medizin. Zeitung d. Verein f. Heilk. in Pr.*, 1843, 136). A girl of five years, of rhachitic constitution and the subject of a tapeworm, broke both thighs in an attack of convulsions. She had had the same accident three times in the two preceding years.

LVIII. Volckamer (*Miscellanea curiosa med.-phys.* Acad. N. C., Dec. 1. Ann. 2, 1671, Obs. 225, p. 327; quoted by Gurlt, *loc. cit.*, 230). A boy of ten years, the subject of epilepsy since three years old. A

few months before death he broke his tibia and humerus in a violent convulsion, and shortly after this experienced more fractures. The autopsy showed still more fractures that had not been recognized.

In these last two cases the fractures were evidently the result of violent muscular contraction, but there must probably have existed fragility as well.

Chaussier (*loc. cit.*) quotes certain cases of intrauterine fractures cited by older writers which seem to be instances of remarkable fragility; but whether these were due to true osteopsathyrosis or to some lack of development cannot be surmised from this nature of the reports. Moreover, as he remarks, there is reason to doubt their existence, since the reports are founded largely upon hearsay. The cases are those of Malbranche, Hartzoeker, and Muys, as follows:

LIX. Malbranche (*Traité de la recherche de la vérité*, liv. 2, chap. 7). A young man, an imbecile, whose body was broken in the same places in which the bones of criminals are broken. He had lived more than twenty years in this state. Maternal impression, from seeing the punishment of criminals on the wheel, was assigned as the case.

LX. Hartzoeker (*suite des Conjectures Physiques*, Amsterdam, 1708). A woman who lived to the age of thirty-two or three years, always confined to bed, with her bones everywhere broken as in the case of criminals. Assigned to maternal impression, as in the last cause.

LXI. Muys (in the preface to *De musculorum artificiosa fabrica*, 1751). A child was born at term to a woman who had seen an execution upon the wheel. The child had all its members broken like those of a thief.

LXII. Notta (*Bull. Soc. Anat. de Paris*, 1849, xxiv. 83). A male child of a healthy mother. The head at birth was remarkably soft and could be compressed like a vessel of water. The child died soon after birth. The autopsy showed ossification but little advanced, and much of the bone of the skull made of numbers of small irregularly shaped pieces about 1 cm. in diameter, and separated from each other by membranous tissue. The bones of the trunk were normal. The tibiæ, femora, and bones of the left forearm were somewhat curved, and the ends of the radii swollen. The bones of the extremities presented 15 fractures, 12 of which were recent, 2 consolidated, and 1 uniting.

LXIII. Harvey (*Med. Herald*, St. Joseph, 1891, x. 255). A boy in whom at birth the whole vault of the cranium was nearly without support or protection. There were double bowleg and anterior curvature [which may have been the result of intrauterine fractures]. When three days old he broke the left arm, and by the age of two and a half months he had 8 fractures. Severe falls had accounted for some of them. [For the others the cause is not stated.] Crepitus was very evident in all fractures. The child grew well and looked well.

LXIV. Schmidt (*Monatssch. f. Geburtsk. u. Frauenkr.*, 1859, xiv. 426). A weakly child of healthy parents, died shortly after an easy birth. All the bones seemed to crepitate when the body was handled, and each seemed entirely broken in two or three places. The head felt like a broken egg. The autopsy showed the bones of the lower extremities three or four times broken; some of the fractures already united, some with slight callus, and some with none. The bones of the head were

composed of numerous small bony plates. Microscopic examination by E. Wagner led to the conclusion that the condition was a congenital non-syphilitic atrophy of the entire skeleton, best described as a chronic parenchymatous osteitis; quite different from osteomalacia or rhachitis or the ordinary osteitis.

LXV. Baudelocque (case described by Marc in *Dict de Sci. Méd.*, 1816, xvi. 64). Labor was rapid and easy, and there had been no violence done to the child, which died a few days after birth. The autopsy showed 43 fractures of the long bones, including most of the ribs. Even some of the cranial bones were broken. Some of the fractures were consolidated and others were in process of union.

This is the same as a case reported by Chaussier (Proces verbal, etc. —see *loc. cit.*, 306).

LXVI. Amand (*Nouveau obs. sur. la. prat. des acc.*, p. 92, obs. viii. Quoted in *Dict. des Dict. de la Méd. Française et Étranger*, 1840, iii. 219). A fœtus of four or five months. The bones were separate and movable in the middle of the forearms, thighs, and legs, and seemed joined only by the skin.

LVII. Griffith (case now reported).

A short review of the affection based upon these reported cases is in place here.

Etiology. As the name idiopathic implies, we find that the histories of the cases collected throw little light upon the cause of the disease. The influence of *heredity* is the only point which strikes us forcibly, inasmuch as direct inheritance, or at least a family tendency, was shown in 18 of the 67 reports. This influence of inheritance is so marked that Gurlt has compared the affection to hæmophilia and Moreau to progressive muscular dystrophy. There is a distinct difference in the line of inheritance, the influence of the male greatly predominating. We notice, namely, that in the 11 families in which direct inheritance (from parent or grandparent) obtained the disease was transmitted in 7 instances from the father, and often from the grandfather as well, and that in 2 more instances, Heister's and Battle's, it descended through an unaffected mother from an affected grandfather. Of the 2 remaining families, in 1, Willard's, the disease appears to have been transmitted from the father, and was certainly so from one of his affected daughters to her children, while in the other, Goddard's, it was the mother who was subject to fractures. In Atherton's case, although the transmission was predominantly by the males, the grandmother as well as the grandfather was subject to fractures.

In the matter of the etiological influence of *sex*, the accounts are not sufficiently accurate to allow of any reliable figures being given, since in many cases the sex of the children is not stated. It is noticeable that of all the cases, young and old, occurring in the family connection of the 18 observations where inheritance or family tendency to the dis-

ease was marked—if we leave out the instances reported by Ekmann as too anomalous—at least 47 were males and but about 19 females, with 24 whose sex is not mentioned. This shows a tendency to a transmission not only through males but to males. Of the total number of cases developing in childhood here reported there are, as nearly as can be counted, 41 males and 32 females; but there are so many others whose sex is not stated that no conclusion can properly be drawn.

As to the *age*, there is a decided tendency for the affection to begin early in life. There are a number of cases reported which began later, yet the abstracts here given, although limited to the disease as seen in childhood, still contain a large proportion of the instances of idiopathic osteopsathyrosis reported for all periods of life. The list does not, of course, contain instances of the secondary forms, which include the atrophic fragilitas of old age. Details are not complete enough to allow of more than general statements, but we find that in many instances fractures occurred before birth, in still more they appeared a little later, and in a few the fragility developed only as growth advanced, notably in the cases of Pauli.

It is worthy of note that the amount of *force* required to produce fractures was nearly always very slight, and sometimes remarkably so. Among the causes mentioned are going upstairs, leaning over, turning around, being moved in bed, tripping, turning in bed, the slightest fall, and the like. In Blanchard's first case the mere weight of the body was sufficient to break the legs, and in my own case the thighs were fractured on one occasion by the child falling forward while in a sitting position.

The influence of *other diseases* in producing idiopathic osteopsathyrosis is problematical. In some cases the children have been weakly, but as a rule this was not the case. The influence of syphilis seems to have been practically negative in the cases I have collected. Were it otherwise they would not be included in the category of an idiopathic condition. The mere fact that a parent was, or was supposed to be, syphilitic is not sufficient to explain the strange fragility. I have, as stated already, excluded from this list those cases in which it seemed reasonable to believe that the tendency to fracture might be the result of the presence of multiple gummata of the bones. So, also, there seems to be no good reason to attribute a special fragility to the coexistence or previous existence of rickets. Rickets is an extremely common disease, yet fragilitas, such as the abstracts exemplify, is rare. Then, too, fragilitas so often appears at an age when rickets has not yet developed, or sometimes comes on when rickets has ceased to be active. It has been claimed that a previous rickets produces later a condition of fragilitas, but this is an assumption for which I have been unable to find any adequate proof.

Pathology and Pathological Anatomy. This is, if possible, even less understood than is its etiology. The relationship of osteopsathyrosis to osteomalacia and to rhachitis is a question which forces itself upon us. It is evident that the process differs entirely from osteomalacia. In this latter affection there is an increasing softness of bone with a remarkable tendency to bending and to absorption of inorganic material. Fractures, if they occur, are purely of a secondary nature, for the prime factor is the softening. The family reported by Ekmann is a pointed instance of a combination of osteomalacia and osteopsathyrosis, or, rather, of the appearance of the two diseases singly or combined in different members of the same family. It is not a proof of their unity.

Rhachitis is much more closely allied to osteomalacia than to osteopsathyrosis. There is in children a natural tendency to infraction of bone—*i. e.*, to the occurrence of green-stick fractures; and in rhachitis this tendency is greatly exaggerated. In osteopsathyrosis, on the other hand, just the reverse of this is seen, and the condition is one of extreme brittleness without disposition to bend. Rhachitis, as has already been pointed out, sometimes causes true fractures, but far oftener does not. When, therefore, we find an excessive degree of fragility in a case of rickets it is rather an evidence that rickets and osteopsathyrosis may be combined in the same individual—not a proof that they are at all identical or even necessarily related. It must, too, be borne in mind constantly that in many cases in which curvature of the limbs is spoken of the condition may very possibly have been the result of fracture and not of bending.

Cases of so-called fœtal rickets have repeatedly been described. The pathological position of this condition is not certain. Orth (*Path. Anat. Diagnost.*, 1894, 681) claims that it has nothing whatever to do with rickets. Some of the reported cases exhibit a remarkable softness of the skull, with great fragility of the bones of the extremities, yet without any of the characteristic symptoms of rickets. Cases of this nature I have provisionally placed in the category of osteopsathyrosis, since they seem to belong there better than elsewhere.

But few chemical and microscopical examinations of the bones have been possible, and these have made the matter but little clearer. In the case reported by Linck the microscopical examination showed that the calcification of the projecting portions (the callus) at the seat of fracture was not perfectly developed, but that the bone elsewhere was normal. In Schultze's case excised pieces of tibia showed the marrow cavity nearly obliterated in the right leg and quite so in the left. But as this was at the seat of former fracture, it taught little. The bones in Barker's case, which is one of the possible instances of imperfect ossification, gave on chemical analysis 33.34 per cent. of inorganic matter, and 66.66 per cent. of organic matter, thus showing a great deficiency in the amount

of the former. On the other hand, in a typical case of idiopathic osteopsathyrosis occurring in an adult and reported by Enderlen (*Archiv f. path. Anat.*, 1893, cxxxi. 223) there was in the portion of femur examined an excess of organic material of only 6.27 per cent.—a figure wholly inconsiderable. Finally, in the case of Schmidt, which was one of the doubtful cases similar to that of Barker, the microscopical examination indicated the presence of a chronic parenchymatous osteitis, which Wagner called a "non-syphilitic atrophy." These are all the examinations which have been made among the cases collected here. As may be noticed, they are contradictory; and, if we leave out the doubtful cases and take only the more typical ones of Linck and Schultze, and the adult case of Enderlen, we find no change present which accounts in the slightest degree for the fragility.

Gurlt suggests that a certain compactness in the bone, rather than any alteration in the chemical composition, explains the fragility, and Ziegler, as quoted by Schultze, suggests some pathological alteration of the basis of the bony framework. Moreau believes that there is some nervous basis for the disease, and that a lesion of the anterior horns of the spinal cord is the most probable cause.

Verneuil (Virchow-Hirsch, *Jahresbericht, etc.*, 1885, ii. 317) examined the urine in three cases of spontaneous fracture, and found it remarkably rich in phosphatic salts, and Blanchard reported a large amount of earthy phosphates in the urine of his first patient. It is possible that this may have some bearing upon the pathology of the disease, but further studies are needed.

An interesting feature of the affection is that in nearly all cases union of the broken bones was prompt, and generally remarkably so. Sometimes the fragments united so readily that, as in Mettauer's case and in the one which I had under observation, professional advice was not even sought for. This rapidity of union has been pointed out by many writers. The most noteworthy exceptions which I have discovered were Blanchard's first and second cases, where union was extremely tedious. Some of the fractures in Velpeau's, Hamilton's, Howell's, and one of Greenish's cases united slowly, and some remained ununited in the cases of Langton, Hamilton, and possibly Willett.

With regard, again, to the cases of very numerous intrauterine fractures, and especially those with soft and crepitating cranii, for whose origin the assumption of an imperfect ossification has been made, it is to be remarked that autopsies show some of the fractures already united and some with callus present. This seems to indicate that actual fractures had taken place, and not that we had to do merely with numerous small separate centres of ossification which had not yet run together.

Symptoms. The symptoms consist, of course, in the occurrence of numerous fractures from insignificant causes. As a rule, the accidents

are painful as in fractures in any other condition. In a few cases, however, it is stated that pain was slight. This was noticed, for instance, in the reports by Battles, Jones, Schultze, Dubrueil, and Blanchard (first and second cases). Pain preceding a break, such as may occur in osteomalacia, is entirely foreign to osteopsathyrosis. As to the bones most frequently affected, it is noticeable that the long bones of the extremities, as well as the clavicles and ribs, are those oftenest broken, and that fractures are especially frequent in the lower extremities. This last is doubtless due merely to the greater strain put upon them. In no case is a fracture of a vertebra or of the pelvis distinctly mentioned, although possibly present in some of the cases of very numerous intrauterine fractures. The position of fracture is entirely independent of the relation of diaphysis and epiphysis. In very few instances was there even the supposition that the condition might consist in the separation of the epiphysis.

When refracture occurred it sometimes happened, as, for instance, in the patients of Willard and Schultze, that the seat of old fractures was the position of new ones. But oftener the bones seem to have broken irrespective of the position of former injury, and in the cases of at least two observers, Earle and Pauli, it is expressly stated that the seat of the old accident did not again fracture. In a few instances, as in the cases of Dupuytren and Langton, actual softening and yielding of the old callus previous to a new break seem to have taken place, but this was quite exceptional and anomalous, and must rather be called a complication than a symptom of the disease.

Diagnosis. In making a diagnosis we have first to determine the absence of other conditions to which the fragility may be secondary. The exclusion of syphilis and of nervous diseases is of importance. Rhachitis presents so many features apart from the breaking of bones that the diagnosis of this disease offers, as a rule, no difficulty. It is questionable whether true osteomalacia ever occurs at a very early age. It has, it is true, been described, as for instance, by Rehn (*Jahrbuch f. Kinderh.*, 1877, xii. 100), but Senator (Ziemssen's *Handbuch der spec. Path. u. Therap.*, 1875, xiii. I. 95) denies the existence of the disease in infancy; and it seems probable that Ziegler (*Lehrbuch d. path. Anat.*, 5 Aufl., ii. 123) is right in considering the reported cases to be really instances of rickets. At the least it can be said that osteomalacia would resemble rickets much more closely than it would osteopsathyrosis.

The absence of local lesions, such as osteitis, caries, tuberculous disease of bone, tumors of bone, etc., is also to be determined.

Prognosis. The prognosis is, as a rule, very unfavorable. The duration of life does not seem to be materially affected by the disease, but the tendency to fracture, once established, is apt to continue unabated. In Mettauer's patient it seemed even to increase with years. The

amount of crippling in bad cases may be very extreme. This was the condition, for instance, in Blanchard's first patient. We may, however, always base a hope of improvement on the fact that a certain number of cases have distinctly outgrown the disposition to fracture. This was notably so in the cases of Axmann and of Graham, where the fragility disappeared by maturity. Some of the children reported by Willard also outgrew the tendency to fracture.

TREATMENT. In such a disease as this, in which both the cause and the nature are so little known, it is evident that the treatment can be but experimental. The administration of alteratives of various sorts, the maintenance of the best general health, and the protection of the limbs against fractures are the indications most apparent, with the hope that as time passes the fragility may be outgrown. Still, while guarding against injury, we must at the same time see that the muscles do not waste. It is likely that a proper lack of muscular support to the limbs may itself increase the tendency to fracture. It is important in case of fracture to secure union of the fragments in proper position, in order to prevent malposition as far as possible. A number of cases have thus reached adult life with but little deformity; while others have grown badly misshapen for want of proper care.

THE TREATMENT OF FRACTURE OF THE CLAVICLE BY INCISION AND SUTURE.

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THE clavicle is more frequently broken than any other bone in the body, the radius, perhaps, excepted. The outer portion of the middle third is by far the most common seat of fracture, because this is the smallest and most sharply curved part of the bone, and must therefore yield to violence more readily than any other portion.

Hamilton (*Fractures and Dislocations*, sixth edition, p. 195) writes that of 157 fractures of this bone, exclusive of gunshot-fractures, 127 were in the middle third, and, excluding the partial fractures, the break was always near the outer end of the middle third; 4 were in the inner third, 17 were in the outer third.

Of 140 cases treated in the New York Hospital (Lent, *New York Journal of Medicine*, vol. 2, p. 159), 3 were near the sternal end, 4 at the junction of the inner and middle thirds, 43 in the middle third, 67 at the junction of the middle and outer thirds, and 23 near the acromial end. Of the 61 cases observed by Hurel ("Les Fractures de la clavicule," *Thèse de Paris*, 1857, p. 48), 44 were of the middle third, and

three-fourths of those were situated at or within half of an inch of its outer end.

Fracture of this bone, like fracture of any other bone, may be partial or complete, single or multiple. Multiple compound and comminuted fractures are rare.

Stimson (*Fractures and Dislocations*, 1883, vol. i. p. 324) had a case of compound fracture of the clavicle under his care in the Bellevue Hospital in 1881.

Hamilton, who had a large experience in fractures, never met with a case of compound fracture, and saw only six cases of comminuted fractures of this bone. But few cases are recorded in which the bone has been broken in two or more places. The line of fracture may be oblique, transverse, or longitudinal. According to the position of the clavicle and the important structures which are near it, severe complications may accompany and be caused by its fracture.

In the second case reported the subclavius muscle was lacerated and its outer portion pulled up between the fragments, and the subclavian vein was in immediate danger of being injured either by the long, sharp inner edge of the outer fragment or by a piece of bone which had been broken off from the inner fragment and was free in the subclavicular region.

This patient was exposed to the same accident which happened to a case reported in the *Progrès Médical*, 1882, No. 16. The report is as follows: a patient, aged fifty nine years, broke the right clavicle in the middle third by a fall upon the shoulder. A large swelling appeared in the supraclavicular region and extended to the level of the parotid. An incision was made and an enormous quantity of blood escaped; the patient died at once in consequence of the entrance of air into the subclavian vein, which had been lacerated by the fragments. The fracture was very oblique from without inward and backward, and the vein was torn completely across by the outer fragments.

Erichsen (*British Medical Journal*, 1873, vol. i. p. 637) reports a case of supposed compression of the subclavian vein by one of the small fragments of a comminuted fracture of the clavicle. Gangrene of the arm appeared on the second day, amputation was performed, and death followed from pyæmia. While the interference with the circulation during life was attributed to compression of the subclavian vein by the fragment, the autopsy showed no signs of such compression.

Annandale (*British Medical Journal*, 1873, vol. ii. p. 82) cut down upon a simple comminuted fracture to remove a fragment which he feared was pressing upon the subclavian vein and might cause it to ulcerate. The patient died, in consequence, it is said, of associated head-injuries.

Mercier ("Des Complications des Fractures de clavicule," *Thèse de*

Paris, 1881) speaks of a case in which the inner end of the outer fragment in a fracture of the middle third of the clavicle had torn the nerve-trunks and caused immediate and persistent paralysis.

Barker (*Trans. Clinical Society of London*, 1886, xix. p. 109) reports the case of a lad, aged twelve years, who was supposed to have received a fracture of the clavicle while in the uterus. He showed a united fracture, but gave no history of injury. For twelve years it gave him considerable pain and trouble. Barker cut down upon it and found fibrous union. He wired the fragments, and the lad's recovery was perfect.

Stimson (*Fractures and Dislocations*, 1883, vol. i. p. 331) writes that injury to the lungs, as evidenced by emphysema, has been recorded in five cases where this symptom seemed to be demonstrative, and in two others in which it is much more likely that the emphysema was due to the introduction of air through a wound of the soft parts. He refers to a case that was under the care of Velpeau, in which the outer fragment was pushed so far in by the fracturing cause that an enormous emphysema of the entire trunk ensued, and no fracture of the ribs could be recognized.

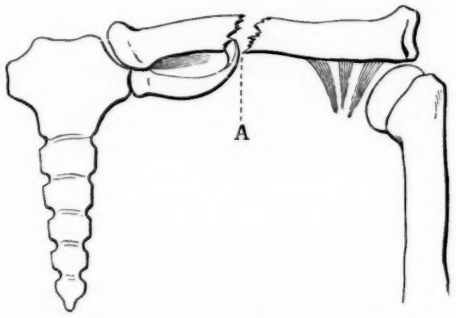
The same authority gives a history of Huguier's case, in which the clavicle was broken by a fall from a height of twenty feet. When the patient was examined considerable emphysema was found to occupy all of the left side of the chest in front and behind, yet there was no fracture of the ribs and no external wound. There was hæmoptysis the following day.

During the summer of 1896, at the clinic in the Jefferson Medical College Hospital, I assisted Dr. W. Joseph Hearn in two operations upon fractured clavicles. The cases were as follows:

Case I.—P. F., a Cuban, aged twenty-five years, was admitted to the accident-room of the Jefferson Hospital, June 16, 1896. He fell from a bicycle while in motion, striking upon the palm of his left hand while the arm was in extension, thus receiving an indirect, simple complete transverse fracture at the outer end of the middle third of the left clavicle. The displacements of the fragments were of such a character and extent that there was no difficulty in recognizing them. The outer end of the inner fragment was very prominent and almost through the skin. The inner end of the outer fragment seemed to be wedged against the inner fragment. Keeping the shoulder upward, outward, and backward with the Velpeau dressing not only failed to keep the fragments in apposition, but caused intense pain. The Desault apparatus failed to maintain reduction. The pressure of the figure-of-eight bandage would have converted the simple fracture into a compound fracture by the pressure on the already almost protruding outer end of the inner fragment. The recumbent position was the most satisfactory. The patient preferred to undergo an operation rather than lie on his back for three weeks during the hot month of June. When he was placed on the operating-table with a sand-bag between the shoulders, the outer fragment was forced upward and backward and was a

trifle higher than the inner fragment. Dr. Hearn thought it best to begin the incision over the tissues where the depression was most marked and follow the direction to which the outer fragment pointed while the patient was in the upright position—namely, downward and inward.

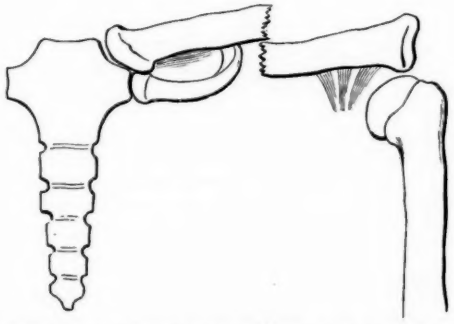
FIG. 1.



The position of the fragments as seen when exposed, the patient being in the recumbent position with a sand-bag between the shoulders.
A, subclavian muscle.

Accordingly a curvilinear incision was made, the margin of the wound retracted, and the fragments exposed. The bone-ends were tooth-shaped and had between them the outer extremity of the subclavius muscle, which was slightly lacerated. This muscle was pushed from between the fragments; the outer fragment was held up by a broad, periosteal elevator, which was placed beneath it and was kept there until a hole

FIG. 2.



The position of the fragments, the patient being in the upright position.

was drilled through from the anterior to the posterior surface. The inner fragment was treated in the same manner. Through these holes, which were a quarter of an inch from the fractured ends, a silver wire was passed and twisted twice from right to left, then hammered down.

The periosteal elevator not only acts well in supporting the fragments, but it serves as a guard in preventing the drill from suddenly breaking through the bone and injuring the important structures beneath. The handle of a tablespoon may be used, as it is wider than the elevator and will answer the purpose equally well if not better. After the fragments were brought together the periosteum was sutured with fine catgut and the external wound was closed with silkworm-gut. The arm was dressed in the Velpeau position, with a light plaster-of-Paris dressing. His highest temperature was 99° F., which was on the night of the operation; the next day it dropped to normal and so remained. In three weeks bony union had taken place, and he had no shortening or discomfort except a little pricking sensation, caused probably by the wire. Fig. 1 shows the position of the fragments and the subclavius muscle. Fig. 2 shows the position of the fragments with the patient

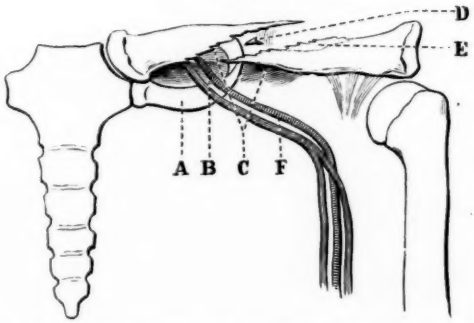
FIG. 3.

standing. Fig. 3 is from a photograph taken three weeks after the operation. It can be seen that both clavicles are very prominent and the deformity is slight. The conical shaped nodule on the left clavicle is caused by the ends of the silver wire, which seem to have risen from the bone, as they can be felt by passing the finger over the clavicle.

CASE II.—P. D., aged twenty-five years, was received in the accident-room of the hospital July 5, 1896. While on a freight-car, which was in motion, he fell off, striking the ground with the point of his left shoulder, causing a simple, complete comminuted fracture at the junction of the middle and outer thirds. The displacement of the inner fragment was marked and the pain was severe. His appearance was quite characteristic; he sat with his body and head inclined toward the injured side and supported the elbow of the injured side with the hand of the sound side. A small spiculum of loose bone could be felt, which was under the skin and over the depression caused by the falling of the outer fragment inward, forward, and downward. The inner end of the outer fragment could not be located, and Dr. Hearn, thinking it might injure some of the important neighboring structures, decided to

operate. On July 7, 1896, an incision three inches in length was carried directly to the bone and in the direction of its long axis. By exposing the part our attention was first directed to a piece of thin bone, which had been broken off from the posterior inferior surface of the inner fragment and was free in the wound. It was shaped like a right-angled triangle; the hypothenuse measured one-half inch; the base and perpendicular each measured about three-eighths of an inch; in thickness it measured one-eighth of an inch. This piece was removed. Another fragment of the bone, which was a little larger than the one just spoken of, was found to be separated from the posterior superior surface of the outer fragment, though attached to it by the periosteum. This piece I replaced and held it in position by throwing a ligature of kangaroo-tendon around the outer fragment, including the detached piece of bone, and tying. In this case, as in the other case, the subclavius muscle was found to be well up between the fragments. The inner end of the outer fragment was long, ragged, and very oblique, and was

FIG. 4.



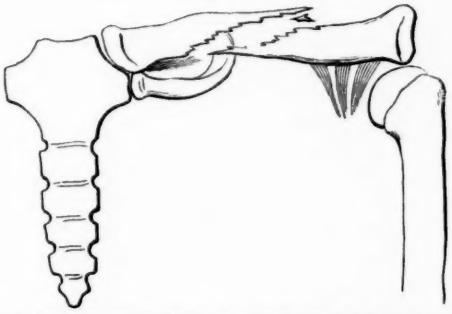
The position of the fragments as seen when exposed, the patient being in the recumbent position.

A, first rib. B, subclavian vessels. C, subclavian muscle. D, loose fragment. E, the loose piece that was attached to the outer fragment by the periosteum. F, axillary vein and artery.

caught in the few remaining fibres of the subclavius muscle, which fortunately kept the sharp end of the bone from coming in contact with the subclavian and axillary vessels. Fresh lacerations of these fibres showed that the fragment was gradually working its way through, and in a short time either direct puncture, pressure, or ulceration of one of the vessels would have ensued. This fragment was brought up and the ragged point cut away, after which both fragments were treated as in Case I. The periosteum was sutured with fine catgut. The skin-wound was closed with Halsted's subcuticular suture and the arm was dressed in the Velpeau position, with a light plaster-of-Paris dressing. His highest temperature was 99° F., which was on the night of the operation. It dropped to normal the next day and remained normal. In three weeks there was good bony union; no pain or deformity. Fig. 4 shows the position the inner end of the outer fragment bears with the third part of the subclavian artery and the first part of the axillary veins, and also the position of the fragments, with the lacerated

subclavius muscle between them. It also shows the piece of loose bone that was free in the wound, and the dotted lines on the upper part of the outer fragment correspond to the piece of the bone that was found

FIG. 5.



The position of the fragments, the patient being in the upright position.

to be loose, hanging to the outer fragment by the periosteum. This figure shows the relation of the parts when they were exposed, the patient being in the recumbent position.

FIG. 6.

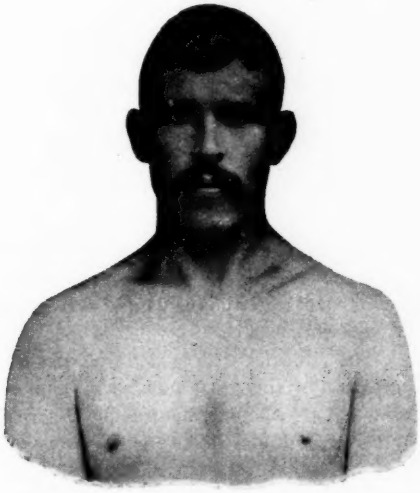


Fig. 5 illustrates the position of the fragments while the patient was standing. Fig. 6 is from a photograph taken three weeks after the operation. There is no deformity and the scar from the operation is

slight. Unfortunately during the latter part of the first week following the operation the dressings became disarranged, and the bandage, which was saturated with perspiration, was in contact with the wound from Saturday night until Monday morning, and naturally the wound became infected. Had this not occurred it would take an expert to tell which side had been operated on.

Langenbeck (*Deutsche med. Wochenschrift*, January 28, 1882) had a case in which the fracture was at the junction of the middle and outer thirds. The fragments were united with silver wire. He claims the result good, but says the scar left by the operation would probably be considered as objectionable disfigurement as union with the average displacement. In our cases it was not a question of deformity or scar, but one of safety and comfort. Modern surgery has taught us to fear closed fractures in certain regions more than open fractures. If the first case had not been operated on, as can be seen by Fig. 2, Case I., the subclavius muscle might have delayed if not prevented bony union. If the knife had not converted the fracture into a compound fracture, the outer end of the inner fragment would have done so in a very little while. Indeed, the tissues above this fragment were so thin that it was impossible to find suitable subcuticular tissue for the Halsted subcuticular suture, which will under favorable circumstances prevent a scar. None of the recommended mechanical appliances in the shape of bandages would have freed Case II. from danger. The loose piece of bone and the long, sharp inner end of the outer fragment subjected this man to great risk. By looking at Fig. 4, Case II., it can be seen that the subclavius muscle afforded little protection to the important neighboring structures.

The pathology of the fracture in this case corresponds exactly in regard to the shape and condition of the inner fragment with a case that is reported in the *Progrès Médical*, 1882, No. 16, in which the autopsy showed the vein to be torn completely across by the inner end of the outer fragment. Whatever may be the seat of the fracture which occupies the body of the clavicle, and whatever may be the cause, experience has taught us that with the bandaging system fractures of this bone seldom get well without a callus, which is apparent and is sometimes unsightly. The difficulty with which fractures of this bone are treated is demonstrated by the great number of appliances that have been recommended. A treatise on fractures by Despre states that the prize founded by Boyer and offered for the discovery of an apparatus capable of preventing the deformity consecutive to fractures of the clavicle has not yet been won. In the outpatient surgical department of the Jefferson Hospital Da Costa has had excellent results in treating fractures of this bone, where the deformity was slight, by the application of the Velpeau or the figure-of-eight bandage, and not a few cases

were treated by simply ordering a triangular sling to be worn for three weeks. The recumbent position with a pad between the shoulders and a small sand-bag over the prominent fragment acts admirably in the majority of cases; but when the fragments are unruly, and when pain is persistent, instead of using silver wire to hold the fragments in apposition we should employ a ligature of kangaroo-tendon, as in Case II., where it was used to hold in position the piece of bone which was broken off from the outer fragment. This piece is now firmly attached and the kangaroo-tendon ligature has been absorbed. Dr. Stimson (*Medical News*, 1885, xlvii. p. 555) had occasion to operate on an ununited fracture of the patella which had been previously wired with silver wire. On exposing the fragments he found that the silver wire had caused cavities in the fragments, and one wire was entirely, the other almost entirely, loose in the wound. He brought the fragments together with catgut. The patient was well, the fragments united, and there was some motion in the knee-joint two months after the operation. The animal ligatures, if strong and aseptic, will answer the purpose better than metal ligatures. They are soft and will not cause pressure-necrosis; neither will they act as foreign bodies, and will last sufficiently long for the process of repair to be completed. Kanagroo-tendon sutures in hernia operations last sixty days. Having the fragments held in apposition by an animal ligature, all that is necessary is to apply a dressing which will keep the parts at rest and allow repair to take place with the least possible effort. This can be accomplished by placing the arm in the Velpeau position and keeping it there by the application of bandages which have been soaked in silicate of sodium. This dressing is considerably lighter than the plaster-of-Paris dressing, and will support the parts equally well. A trap-door should be made in the silicate dressing over the seat of the fracture, so as to allow an occasional examination of the wound. The edges of the wound should be brought together with the Halsted's subcuticular suture and the wound sprinkled with iodoform and dressed with bichloride-dressings. Before the silicate of sodium bandages are applied the arm, chest, back, and the point of the injured shoulder must be covered with absorbent cotton and held in place by a flannel bandage. Unless the temperature indicates trouble, the wound needs no attention for the first week; at the expiration of that time the sutures should be removed. All the dressings should be removed at the end of the third week, and the patient should be ordered to carry the arm in a triangular sling for another week.

Since this report I have assisted Dr. J. Chalmers Da Costa in a successful case in which the centre fragment was but little more than an inch long. The case will be reported later.

REVIEWS.

PRACTICAL DIAGNOSIS. THE USE OF SYMPTOMS IN THE DIAGNOSIS OF DISEASE. By HOBART AMORY HARE, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia; Laureate of the Medical Society of London, of the Royal Academy in Belgium, etc. In one octavo volume of 566 pages, with 191 engravings and 13 full-page colored plates. Philadelphia and New York: Lea Brothers & Co., 1896.

THE tendency of the day is evidently toward diagnosis by the aid of laboratory methods, by the use of the microscope, the culture-medium, and the test-tube. The student is trained to be an expert in the detection of tubercle-bacilli, of differences in the appearance of cultures, of color-reactions, rather than to be a close observer of the grosser changes in the appearance of the patient, the behavior of the pulse, of the temperature, etc. The student of to-day hesitates to make a diagnosis of tuberculosis, though the constitutional symptoms and the physical signs all point in that direction, until he has found tubercle-bacilli in the sputum. The older physicians recognized typhoid fever by the prodromal symptoms, the course of the temperature, the tongue, the tympany, the condition of the bowels, the spots, the mental condition, and the spleen. The graduate of to-day withholds his diagnosis until he obtains Ehrlich's reaction or Widal's test, or finds typhoid bacilli in the blood obtained by puncturing the spleen or proves them present in the stools by Elsner's method. The tendency, therefore, is to undervalue many of the older methods of diagnosis upon which our forefathers relied.

Hare's work is written with the object of overcoming, in a measure, this tendency and of showing that much can be learned of the condition of our patients by what are commonly called symptoms. Hare does not, however, undervalue the laboratory method of diagnosis; in fact, frequent reference is made in the book to this method; but he does insist, and strongly, that by the use of our five senses, without the aid of microscopes, or test-tubes, or special instruments, great aid in diagnosis can be obtained.

The impression that one receives after reading the work is that it is a collection of most valuable hints rather than a complete and exhaustive treatise upon the subject of practical diagnosis by symptoms. Even the most skilled and experienced physician cannot help but derive good from its perusal, for he certainly will receive some new suggestions or have a well-known fact put in a new light. The statements that are made are made as the result of the author's own experience and of his wide reading, and embody many of the traditions of our forefathers which are too valuable to be lost. Some statements are made rather

dogmatically; the reasons are given why other statements are true. In some places the topics are treated with a great deal of completeness. Other subjects are rather more hastily dealt with; and, occasionally, there is what seems to us an omission. For instance, the author could well make some reference to the blue-line on the gums in lead-poisoning; and in describing the joints it would be well to refer to new-growths affecting the joints and to tubercular joints. One might take exception also to some of the statements; as, for example, where he tells us that a very large proportion of cases of epilepsy have their origin in syphilis. In general, however, the statements are such as would meet with general approbation.

The book is eminently practical. This is seen not only in the clear portrayal of symptoms in the text, but as well in the illustrations. Almost without exception these have been selected because they serve some definite purpose in making clear some otherwise obscure point. Many serve to illustrate the subject of nervous diseases; and some of the diagrams illustrating the mechanism of nervous symptoms are particularly serviceable. We would also speak of the illustration on page 322, showing the explanation of the symptoms of cirrhosis of the liver. This is a point, in reality, very simple, but yet always difficult for students to grasp, and the diagram from Taylor makes these symptoms clear at a glance.

The work is divided into two parts: Part I. dealing with the Manifestations of Disease in Organs; Part II. the Manifestations of Disease by Symptoms. Hare assumes that the natural method of arriving at a diagnosis is for the physician to note a prominent symptom, and then to consult a work under the head of this symptom, rather than to make a probable diagnosis of the disease in question and then to consult a text-book to see whether the disease fits the description in the book. Thus, for instance, the physician finds a patient vomiting. He does not make a probable diagnosis of the disease inducing vomiting, but turns rather to the article on vomiting, finds the disease of which this may be a symptom, and in that way reaches his diagnosis as to the diseased condition. While this may be true in many instances, in practice, at least, most physicians after studying the case make a probable diagnosis not upon one symptom, but rather upon the symptom-complex; and then, if in doubt, consult their references to see if this is a correct position.

The work is made much more valuable as a work of reference by two very complete indexes; one an index of diseases, the other an index of symptoms, organs, and terms. By putting in two indexes our author has really made his work available to the physician who wishes to consult it either because he believes he has a certain definite disease to deal with or because he wishes to see what disease the symptom that is present indicates.

We believe that the book is more valuable for practitioners than for students, merely for the reason that the physician of wide reading and experience takes a broad and comprehensive view of the topics treated and can place them better in their proper relations one to another. The student, with his narrower vision, is apt to get wrong conceptions of the disease from the study of single symptoms and signs. The book makes interesting reading, and, as before said, even a physician of wide experience is sure to gain much knowledge by reading it. It has appeared very opportunely and can be relied upon to call the attention of physi-

cians to the fact that, important and indispensable as laboratory aids to diagnosis are, there is yet another side to diagnosis—that of the bedside observation and interpretation of symptoms. J. B. H.

TEXT-BOOK OF GENERAL PATHOLOGY AND PATHOLOGICAL ANATOMY. By RICHARD THOMA, Professor of General Pathology and Pathological Anatomy in the University of Dorpat. Translated by ALEXANDER BRUCE, M.A., M.D., F.R.C.P.E., F.R.C.S.E., Lecturer on Pathology, Surgeons' Hall, Edinburgh; Pathologist to the Royal Hospital for Sick Children; Assistant Physician and formerly Pathologist to the Royal Infirmary, Edinburgh. Vol. I. 8vo., pp. xix. 624, with 436 illustrations. London: Adam & Charles Black, 1896.

No one who thoughtfully reviews the progress of pathology during the past fifteen years can fail to discern the development of a very striking demonstration of the cause-and-effect relationship of the various processes of disease to their respective causes. The study of the bacteria, of their products, and of their influence in the production of certain well-marked pathological types has illumined a group of diseases formerly most obscure, and has shown the intimate relationship in each case of the specific cause to the particular structural and other changes characteristic of the disease.

Since science has long considered this simple cause-and-effect relationship an essential part of all natural phenomena, the tardy demonstration of such a relationship in pathological processes has been a distinct obstacle to the inclusion of pathology among the biological sciences. Until the appearance of final proof that in disease a similar relationship exists, and that pathological processes are governed by the same unchanging laws which control all other natural phenomena, it was almost impossible wholly to suppress the feeling that in disease we have to do with something occult and different from the ordinary phenomena of nature as revealed to us by the study of natural science. As has been hinted, this feeling was in great part due to the mystery which surrounded the occurrence of epidemics and of the endemic infectious diseases, and so long as this uncertainty continued the appeals of the pathologist to natural laws for aid in the elucidation of his problems were necessarily coupled with a measure of doubt as to the entire applicability of those laws to the processes of disease. With the demonstration of the complete causal relationship of the bacteria to infectious diseases the mystery has vanished and the last objection to the classification of pathology as a science has been removed. We may now apply with assurance the laws of physics and chemistry to the explanation of pathological phenomena.

Unfortunately, many of the authors of our text-books of pathology appear to have been slow to grasp this broader conception of disease, and their elucidation of pathological processes has been in so far limited and unsatisfactory. It is, therefore, a noteworthy merit of Professor Thoma's work that in it we meet ever-recurring evidence that the author has constantly in mind the wider relationship of disease to other biological phenomena. Everywhere he has aimed to adduce a rational

explanation of the various phenomena which he describes, bringing out wherever possible their conformity to physical and chemical laws.

As would be expected, both from the rather special field of Thoma's personal researches and from the nature of the problems presented, the application of these principles is most complete and convincing in the chapters treating of the various disorders of the circulation, of the bloodvessels, and of inflammation. Hence we find histo-mechanical principles applied to the explanation of the development of new bloodvessels, and to the elucidation of the rate and character of the blood-flow through the vessels in the various conditions of anæmia, congestion, thrombosis, embolism, infarction, etc., and in the development of a collateral circulation. Again, we meet a similar line of discussion of the various phenomena of inflammation, and are as a result afforded rational explanations of stasis, diapedesis, emigration, exudation and transudation, etc.

While about one-quarter of the book is occupied with the discussion of these subjects, we nevertheless find in it also a careful presentation of our knowledge of the effects of traumatism upon the tissues, of intoxications and infections, of malformations, of the bacteria and of parasites, of malformations, of heredity, of the various nutritional disorders, and of tumors. In this way the work is made to cover all those subjects which relate to disease in general and which, together, comprise what is now usually included in the term "general pathology."

In a work of the magnitude of the present, and dealing with so wide a range of facts, some unevenness of presentation is almost inevitable. In the book before us this is due more to the unwonted elaboration of certain themes than to the neglect of any. Thus, in the chapters dealing with the changes in the circulation incident to disease and with inflammation we have a degree of elaboration of the subject such as is to be met with in no other general work on pathology with which we are acquainted, and in contrast to this other parts of the work appear at first sight to be somewhat neglected. As we examine them more critically, however, they are found to contain a concise and philosophical statement of the subjects which they treat, in which are included all the essential facts pertaining to them. If any part of the book is at all slighted, it is that which deals with the description of the various types of pathogenic bacteria. But this can hardly be cited as a fault, since in its astonishingly rapid development descriptive bacteriology has almost of necessity become a special field of research, and, as it happens, one which has not, so far as we know, attracted Professor Thoma to its ranks. Notwithstanding his very numerous writings in other departments, we are not aware of the publication by him of any original researches upon that subject.

As has been said, then, the work may be set down as a most excellent and philosophical presentation of the facts of general pathology, with a very special elaboration of certain of its departments. Throughout it is abundantly and well illustrated by a large number of excellent woodcuts and by four chromo-lithographic plates, a large proportion of the illustrations being entirely new. At the close of each section is a carefully prepared bibliographical table of the literature bearing upon the subject under discussion, and an index completes the book.

The work of the translator has been carefully and acceptably executed.

J. S. E.

A Text-book of Bacteriology, including the Etiology and Prevention of Infective Diseases, and a short account of Yeasts and Moulds, Hæmatozoa, and Psorosperms. By Edgar M. Crookshank, M.B., Professor of Comparative Pathology and Bacteriology and Fellow of Kings College, London. Fourth edition. Reconstructed, revised, and greatly enlarged. 8vo., pp. xxx. 715. Twenty-two plates and 273 wood-engravings and photographs. London: H. K. Lewis, 1896.

This very handsome volume is a much enlarged and altered new edition of the author's well-known work upon bacteriology; so much so that, as is stated in the preface, it is, practically speaking, "a new work." Besides a careful reconstruction of the text there have been added twenty-six new chapters.

The work is divided into three parts, the first being upon methods, and including the most recent that have been generally adopted in studying the bacteria and investigating the etiology of disease. The methods of photographing the bacteria are briefly given in this division. Part II. deals with the infective diseases and the bacteria associated with them. Some of the subjects introduced are not usually spoken of in works of this kind, the writer upon bacteriology usually confining himself to such diseases as have had specific bacteria associated with them. The author's position, of which we approve, is that "in many diseases of man and animals it has not been possible to identify the contagium with a bacterium, or, indeed, with any micro-organism; but when the virus is chemically examined, or investigated with a view to protective inoculation, or utilized for experiments in serum therapeutics, such researches are within the province of the bacteriologist."

Part III. is systematic and descriptive, and contains a more or less extended account of about five hundred bacteria. The list as arranged for bacteriological diagnosis (p. 485 *et seq.*) is likely to be especially useful. There are five appendices upon yeasts and moulds, hæmatozoa, coccidia, apparatus in bacteriological laboratories, and bibliography, with a supplementary appendix containing extracts from the final report of the Royal Vaccination Commission.

The book is exceedingly well printed, and the plates and drawings support the author's well-known reputation in this direction. It is to be regretted that more attention has not been paid to the very excellent work done in this country. H. C. E.

Reference-book of Practical Therapeutics. By Various Authors. Edited by Frank P. Foster, M.D., Editor of the *New York Medical Journal* and of Foster's *Encyclopædic Medical Dictionary*. Vol. I., A to Myrtol, pp. 652. New York: D. Appleton & Co., 1896.

If evidence were wanting that the days of therapeutic nihilism are past, this very satisfactory reference-book would supply it. Recognizing the patience, extensive information, and painstaking industry of the editor, a lexicographer of ability, we have expected much, nor have we been disappointed. Although he has contributed extensively to this volume, we wish at times that it had been more. Yet we cannot expect

that an editor shall be omniscient, so that errors of his collaborators escape correction. With so much that is excellent in the plan and in its accomplishment, the reviewer may seem to be captious as he calls attention to incorrect details; yet for reference accuracy is of the highest importance. We note a few departures from exactness which we have recognized. Pearson's solution of arsenic is not the equivalent of the official liquor sodii arsenatis, but is one-tenth as strong. We doubt if potassium permanganate is an antidote against all organic poisons; at least this is much further than the most enthusiastic advocate of its use (Moor) is ready to go. At times references are not to the best or most complete papers upon the subject—*e. g.*, Asaprol, from Cerna; Cereus grandiflorus, from Sharp, who obtained nothing because he used inert material. In the last instance the therapeutic summary is hopelessly bad. In Cocillaña a glucoside is credited to Eckfeldt, whereas in 1893 Eccles found an alkaloid which he named Rusbyine. Among active principles might well have been enumerated the amaroids. Some sections are incomplete; for instance, that upon the internal use of antiseptics. The Pharmacopœial etymology and nomenclature have at times been departed from. Taken as a whole, the work shows that authors have, as a rule, been consulted in the original. Yet there are exceptions, and we appreciate the indirect compliment to the department of Therapeutic Progress of this JOURNAL in noting that one of the collaborators, at least, has consulted it. Typographical oversights are exceedingly rare; perhaps the misspelling of Susruta is the most glaring. The work will not supplant the text-book, system, nor dictionary, but it will to some extent supplement them. It will be useful to student and practitioner alike, and deserves a convenient place for daily use.

R. W. W.

DIE KRANKHEITEN DER WARMEN LÄNDER. EIN HANDBUCH FÜR AERZTE. Von DR. B. SCHEUBE, Fürstl. Physikus und Sanitätsrat in Greiz, früherem Professor an der medicinschule in Kioto, Japan. Jena: Gustav Fischer, 1896.

TROPICAL DISEASES. By DR. B. SCHEUBE.

THE peculiarities of disease in the tropics are becoming of greater and greater importance, and for those who have to deal with them, either in their homes or in the persons of returned travellers, we know of no more useful guide than this one. That the author, a worthy disciple of the careful school of Ernst Wagner, made good use of his time while professor in the medical school in Kioto was shown before this by scattered articles and more recently by his masterly monograph on beriberi.

The various diseases are described systematically, beginning with general infectious diseases. Then follow intoxication (pellagra), diseases due to animal parasites, diseases of organs, and external diseases. The history and geographical distribution of each disease are briefly described. The remarks on prophylaxis and treatment are sufficiently

full and explicit. At the end of each chapter is a useful bibliography. A few of the author's statements seem to require comment. He believes that two distinct conditions have been and may still be included under the term typho-malarial fever. In one the patient has a combination of both typhoid and malarial infections, the clinical characteristics of which vary in different cases. The other is a malarial fever pursuing the course of typhoid. No protocols are given to sustain the latter view, the author's observations having been made before the parasites were known, but from his description we fail to see how he can apply the term as he does. A case like that of Dr. Scheube's second form (p. 95) is at the present time under the observation of the writer of this review. In this case the patient has not been exposed to malaria and his blood shows no parasites. Our experience goes to show that in non-malarial localities such cases are not rare, while, on the other hand, we know of no observation showing the existence in them of malarial parasites. The statement found in all German works on the subject, that anchylostomiasis occurs in the Southern United States, is repeated by Dr. Scheube, but as no references are cited we suppose he is only repeating the old and erroneous statements of Hirsch and others.

The author holds that amœbæ have not been proved to be the causes of dysentery, but his objections to the views of those who have a contrary opinion are not altogether relevant. Especially irrelevant are the assertions that cases of dysentery occur without amœbæ, and that amœbæ occur in the stools of persons without dysentery.

The volume is well printed. It can be recommended as a useful handbook, and especially to explorers, medical missionaries, and others who are called upon to face the diseases common in or peculiar to the tropics. G. D.

MITTEILUNGEN AUS DEN GRENZEBIETEN DER MEDIZIN UND CHIRURGIE. (CONTRIBUTIONS FROM THE BORDERLAND OF MEDICINE AND SURGERY.) Edited by J. MIKULICZ and B. NAUNYN. Vol. I., Part IV. INJURIES OF THE VERTEBRAL COLUMN, WITH A CONTRIBUTION TO THE PHYSIOLOGY OF THE HUMAN SPINAL CORD. By THEODOR KOCHER. 8vo., pp. 245. Jena: Gustav Fischer, 1896.

A SERIES of monographs with the very happy title of Contributions from the Borderland of Medicine and Surgery has been projected by Mikulicz, the distinguished surgeon of Breslau, and Naunyn, the equally distinguished physician of Strasburg. The present contribution is an extensive monograph on Injuries of the Spine by Kocher, apparently not complete, since it terminates with the statement that the conclusion will follow. Whether this means the conclusion of the volume or of Kocher's monograph is not clear.

The portion before us consists of 245 pages of text, illustrated by five plates and eighty-six figures in the text. The illustrations are admirable; the half-tones, largely from specimens, really illustrate the text which they accompany, and give one an admirable idea of luxations, fractures, fracture-dislocations, etc., as well as the pose of

the patient after such accidents. The plate (V.) which illustrates fracture of the spine is certainly the most beautiful of the kind we have ever seen, the color and the drawing being true to life. Then follows a plate giving the cutaneous distribution of the various nerves, distinguished by varying colors, followed by two plates, admirably shown in colors, also illustrating the muscular distribution of the brachial plexus, and another of the lumbar and sacral plexus, and finally the distribution of herpes zoster of the face and neck in line with the distribution of the nerves.

In addition to this, seventy-eight cases are referred to at greater or less length. The material at hand, therefore, for so accomplished a clinician as Kocher is very great.

The book consists of two parts: first, injuries of the vertebral column with an addition on the physiology of the human spinal cord, and, secondly, lesions of the spinal cord in injuries of the vertebræ. The author takes up contusions, distortions of the vertebræ, and unilateral luxations, and, later, isolated fractures of the vertebræ; next, total fracture-dislocations, considering them first in general, and then later the special indications in each region of the body. The same course is pursued with the spinal cord: first, partial lesions, including contusions, hemisection by stab-wounds, etc., and later the total transverse lesions. Each region of the body is considered separately, from the cervical region to the cauda equina. In general it could be predicted of so accomplished a surgeon that his advice would be sound and his treatment neither too radical nor too conservative.

With the space at our command it is impossible more than to indicate, therefore, the general scope of the work. To take up controverted points and discuss the views of the author upon each of them would burden our readers too much. It is one of the books "to be chewed and digested."

W. W. K.

THE OPERATIONS OF SURGERY. By W. H. A. JACOBSON. Third edition. 8vo., pp. xiv. 1337, with 398 illustrations. London: J. & A. Churchill, 1897.

THE nine years that have elapsed since the publication of the first edition finds the book in its third edition increased by over 300 pages and the woodcuts doubled in number. The 300 pages, however, do not represent the whole of the addition, inasmuch as the sections on Antiseptic Surgery and on Anæsthetics have been omitted and their places filled with new matter. The reason for the omission is because the author believes that Mr. Lockwood's *Aseptic Surgery* and Dr. Hewitt's *Anæsthetics and their Administration* have practically replaced the two chapters which formerly were found in his own book. We are almost sorry for the omission, because the two chapters are very important, and, at least on this side of the water, the books which are expected to replace them would scarcely be in the hands of more than an occasional reader.

It is hardly necessary to review Mr. Jacobson's book. It has so thoroughly established itself as, at least in our opinion, the best operative

surgery that we are acquainted with, that praise seems almost superfluous. Of all the books in our own library this is the one most frequently consulted, and if American surgeons knew it as widely as we would like, it would be in every library. Its superiority to other operative surgeries consists in the fact that it is far more than a mere manual of surgical technique. It considers in almost all operations the indications for the operations, the danger and difficulties the surgeon will encounter, and the modes of avoiding them or meeting them, the causes of failure, the aids in difficult cases, and in very copious foot-notes many details both of theory and practice which are of the greatest possible value.

American surgeons certainly have every reason to feel kindly to Mr. Jacobson, for he has been most generous in his recognition of their work. In running over the index of names for only the first four letters of the alphabet, we have found over twenty American surgeons whose work is referred to. On page 1302 Cheever has an unnecessary "s" and Halsted an unnecessary "a" in his name.

It seems strange to us in America that a man of Mr. Jacobson's years and fame should still be "*Assistant* Surgeon to Guy's Hospital," but then we suppose we ought to remember that the Prince of Wales is hard on to threescore years. Certainly Mr. Jacobson's renown has added much to that of Guy's Hospital, and we hope will long continue to add to its lustre.

We note one sorrowful change from the last edition: the dedication to his "three old friends," Arthur E. Durham, James F. Goodhart, and Edwin C. Greenwood, has added to it an appropriate Latin eulogy of Mr. Durham, who was so well known to many of his American readers and is lamented by them all. W. W. K.

THE RETROSPECT OF MEDICINE. A HALF-YEARLY JOURNAL CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES. Edited by JAMES BRAITHWAITE, M.D. Lond., etc., assisted by E. F. TREVELYAN, M.D. Lond., B.S., M.R.C.P., etc. Vol. CXIII. January to June, 1896. London: Simpkin, Marshall, Hamilton, Kent & Co., Limited.

THAT this well-known work retains its favor with the profession is due to the wise selection of its matter. Especially within the last few years have periodic reviews of medical progress multiplied. Many of them are much larger than *Braithwaite*, and so can give a much more extensive review than is possible in a smaller compass. But for the busy physician, who looks rather for a careful selection of the news of the day than for a survey of the whole field, this volume is difficult to excel. The selections are almost always admirably chosen. Occasionally an article of minor worth has been selected. So Fränkel's thyreo-antitoxin is mentioned, but not Baumann's more important thyroiodin. For the purpose we have mentioned, it is perhaps not an objection that many of the articles are taken at second hand. The printing and paper of the present volume are much better than in the edition long popular in America, and will no doubt assist in keeping up the reputation of the series. G. D.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.D., LL.D.,

PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

Treatment of the Bubonic Plague.—Dr. E. Roux describes the preparation of the serum by Yersin as follows: The subcutaneous injection into horses of a fresh plague-bacillus culture upon agar having been followed by severe local swelling, a fever which disappears, and an abscess, the intravenous inoculation was resorted to, and in this way abscess-formation was avoided. Vigorous reaction follows these injections until, after repeated and stronger doses, immunization is accomplished. Three weeks after the last injection a serum is obtained by venesection. In the first instance of its use two injections of two drachms each sufficed for a cure. Of twenty-three patients subsequently treated, but two died; both received their first treatment on the fifth day of the disease, one dying five and the other twenty-four hours after the single injection. It should be remembered that the serum does not long retain its activity, and, as compared with that for the treatment of diphtheria and tetanus, that it is weak. It is desirable that we should have a more powerful serum, which shall act better and in smaller doses. In four instances more serum was used than was necessary, and injections were made during convalescence in order to insure cure. To answer the question whether this serum possesses an antitoxic or only an antibacterial action presupposes a knowledge of the toxin of the plague; this is wanting. Although at present this serum has been used only upon patients with developed disease, yet it is fair to presume that it is still more valuable as a preventive, thus limiting the disease to its point of outbreak.—*Therapeutische Wochenschrift*, 1897, No. 5, S. 97.

Peronin.—Dr. Schröder presents this remedy as useful for the cough of tuberculous patients. This is produced when the hydrogen atom of the hydroxyl group of morphine ($C_{17}H_{18}NO_2(OH)$) is displaced by the alcohol radical ($C_6H_5CH_2$). In twelve instances, reported in detail, comparison has

been made between the effects produced by this drug and those from codeine phosphate. The remedy was administered on an average of seven days, in doses increased from one-third to two-thirds of a grain. In eight of these the cough-irritation was immediately and markedly relieved; in two this was obtained only after larger doses, and in two there was no result. As to the amount and ease of the expectoration, in six cases there was no result; in five it was checked; and in one it was lessened, but more difficult. There was no disturbance of digestion, except that two patients complained of morning nausea and tendency to constipation. In all cases there was better, more restful sleep. In two instances, after larger doses, on the following morning there were noticed headache and lassitude, more frequently observed after morphine. It is preferable to codeine in that the sleep is better and there is no excitability. The remedy can be administered in solution in water, tea, with alcohol, or as a pill.—*Therapeutische Monatshefte*, 1897, Heft 1, S. 4.

The Analgesic Effect of Lactophenin.—Dr. Charles S. Potts reports that he has made use of this drug in five cases of neuralgia involving the branches of the trigeminus, four of which were relieved; in one case of severe sciatica that was benefited for a time; in two cases of severe reflex pain, due to irritative conditions elsewhere; in two cases of migraine, two of muscular rheumatism, two of the characteristic pains of tabes dorsalis, all of whom received benefit from its use; and in four cases of simple headache, presumably benefited. The dose varied from four to ten grains.—*Therapeutic Gazette*, 1897, No. 1, p. 8.

Eucaine.—Messrs. W. Jobson Horne and Macleod Yearsley report their observations, using this anæsthetic in the surgery of the throat, nose, and ear. The solutions were of the strength of 2, 5, and 8 per cent. The first was quite sufficient for anæsthetizing the uvula, for laryngoscopy or posterior rhinoscopy, and for aural examinations. The 5 and 8 per cent. solutions were used for operative measures. The methods of application are: (1) For the ear, warm instillations retained for from five to eight minutes by inclining the head to the opposite side. (2) For the nose, either simple swabbing or the insertion of a pledget of cotton (soaked in eucaine solution) for five to ten minutes. (3) For the throat, simple swabbing with a pledget of cotton. On no occasion was the drug applied by means of a spray. The anæsthesia is slightly slower in onset than that of cocaine, but when established is fully equal to it. The duration of anæsthesia is from ten to twenty minutes. So far as may be concluded from these observations the pulse has remained the same in rate and character throughout; in no instance has there been any slowing. In the only instances of unpleasant effects upon the circulation, three in number, the cause could not be attributed to the action of the drug. The local effects have not been completely studied. It has not been found to cause hyperæmia of the turbinate bodies; in fact, in several cases it has caused slight ischæmia, which, however, was not to be compared with that of cocaine. In no case was there hemorrhage after operation. Whether or not it has any effect upon the amount of saliva must be left for future investigation. With the exception of the three instances above given there have been no unpleasant after-effects noted. Eucaine cannot,

however, wholly replace cocaine, since the effect of the latter in reducing the size of the turbinate bodies gives it a value as an aid to diagnosis which the former apparently does not possess.—*British Medical Journal*, 1897, No. 1821, p. 134.

Dr. Lewis S. Somers writes of this drug as a local anæsthetic in hypertrophic rhinitis. A 4 per cent. solution in distilled water, applied on a bit of cotton, produced anæsthesia in from eight to ten minutes, which lasted about twenty minutes. It produces a temporary local congestion, which militates greatly against its use in active inflammatory conditions; but this may possibly be obviated by using equal parts of eucaine and cocaine, as recommended by Berger. Reichert claims that, aside from its anæsthetic action, it is harmless in medicinal doses, not rapidly and suddenly affecting the heart, as does cocaine; and, further, that it exerts a curative action in diseases of the Schneiderian mucous membrane, independent of its anæsthetic properties. Another advantage is that it may be kept for an indefinite time in a 1 to 10 solution in sterilized water, which may be repeatedly boiled without losing its anæsthetic properties.—*Therapeutic Gazette*, 1897, No. 1, p. 11.

Dr. P. Silex remarks that this drug, although producing anæsthesia of the cornea, caused severe burning and marked injection of the conjunctiva, so that its use was soon discontinued. In seeking a substance which should be free from these undesirable properties another substance was discovered which chemically is not only related to eucaine, but also to cocaine, and especially to tropa-cocaine, but differing from the last in that it is much less toxic. This can be boiled without decomposition, and is soluble at ordinary temperatures up to 5 per cent. It does not produce irritation, and can be used for subcutaneous injection and by Schleich's infiltration method. This substance, in distinction from eucaine, has been designated eucaine B. When used in 2 per cent. solution it anæsthetizes with greater rapidity than does eucaine, and that without change in the calibre of the bloodvessels in one-half of the cases; in the other there is a slight pericorneal injection. The diameter of the pupil is unchanged, the sphincter reacting to light and convergence. Its use upon inflamed eyes and for operation shows that this is a real addition to the therapeutic resources for producing local anæsthesia.—*Deutsche medicinische Wochenschrift*, 1897, No. 6; *Therapeutische Beilage*, S. 1.

The Medical Treatment of Epilepsy.—Dr. Frederick Peterson notes among recent remedies one to two or three drachms of the tincture of simulo thrice daily are harmless and deserve trial. Solanum carolinensis in his hands has proved of no value whatever. The opium-bromide treatment of Flechsig is of great value for many patients, especially in old and obstinate cases, when all other agents have proved ineffectual. Adonis vernalis conjoined with the bromides is an efficient method of treatment. In cases of autointoxication the regulation of the diet, frequent drinking of hot water, occasional flushing of the large intestine, the use of intestinal antiseptics, are all indicated.—*New York Medical Journal*, 1896, No. 914, p. 738.

The Effect of Diet upon the Fits of Epilepsy.—Dr. Alexander Haig from his studies believes that the uric-acid fluctuation is the cause of the

fits. By diet he reduces the intake and formation of uric acid, so that the largest quantity that the patient is likely to get into his blood as the result of such fluctuation shall never, or only very rarely, be sufficient to affect the blood-pressure and the intracranial circulation to a serious extent. The epileptic wave of excretion runs very high, but only for a short time, and it is very difficult to keep the general level of uric-acid excretion so low that these waves shall not occasionally get high enough to do damage by raising the blood-pressure and affecting the intracranial circulation. Here flesh-food must be avoided entirely and all soup and meat-extracts regarded as poisonous; while tea, coffee, and cocoa, and all other vegetable substances containing xanthin compounds, are to be regarded as containing uric acid, and used, if at all, only as the merest flavoring. From the facts mentioned in this paper it is pretty clearly shown that the fits of epilepsy and convulsions in general have an extremely close relationship to the uric-acid headache (migraine), and like this are probably functional disorders due to altered circulation in the brain, such altered circulation again being due to the contracted arterioles and high blood-pressure caused by uric acid. Since the headache is controlled with almost absolute certainty by a diet which frees the blood from the excess of uric acid, so it is hoped that it will be found that many fits will yield in the same way to well-directed treatment.—*Brain*, 1896, Part 2, xxiii. p. 68.

The Composition and Action of Natural and Cultivated Vaccine and Variolous Material.—Dr. John B. Buist finds that it is expedient to sterilize tubes before using them, as opacity develops sooner in lymph stored in commercial than in sterilized tubes, and it is greater in amount. To prevent this opacity there must be sterility of the fluid and of the tubes. Since arm-to-arm vaccination conducted under a cloud of carbolic spray was a complete failure, it is proved that antiseptics and active vaccine material are incompatible. After experimentation the conclusion was reached that modified vaccine materials produced by growing lymph in solid media were unsuitable for vaccination purposes; because, if vaccine lymph be really modified variolous lymph, the cultivated vaccine materials were further modifications of a modification, and success in this direction was impossible. It appeared more probable that variolous lymph might be easily modified by cultivation otherwise than in the animal body, and that this cultivation of variola would be a true modification of the specific virus, having properties of a much milder character than the original. Experimental vaccination proves that these cultivated materials differ from the natural, not only in form, but in physiological action; and the conclusion is irresistible that they are not in that form the cause of either local vaccinia or variola. While, therefore, a bacterium of constant form to be found in clear vaccine and variolous lymph is probably the cause of vaccinia and variola, it appears to be practically impossible to reproduce the same bacterial form by artificial cultivation in solid media outside the animal body. The organisms in vaccine and variolous cultivations are growth-forms or developmental conditions of the organisms in clear lymph. The organisms in clear lymph are spores which develop into the large forms when cultivated in solid media. Clear vaccine and variolous lymph, in the author's opinion, contain spores of bacteria in suspension,

which are distinguished from the micrococci of cultivation by their characteristic difference in size. In the same way opaque lymph, which is an imperfect material for vaccination, may be regarded by a natural cultivation of the organisms existing in clear lymph, and this natural cultivation is the cause of the opacity of lymph. On comparing opaque with clear lymph we find that there is a great increase of organisms in the former and that they are distinctly different in size and arrangement. Clear lymph is alkaline and opaque lymph is acid in reaction, and this is observed not only in stored lymph, but also in fresh, opaque lymph as it issues from an inflamed vesicle. If it is desired to prevent the development of the spores, the lymph must be dried, which preserves the bacterial form originally in the lymph at the time of storage.—*The Practitioner*, 1896, No. 335, p. 480.

The Accidents of Vaccination.—Mr. T. Colcott Fox places in the first group all those deviations from the typical evolution of the vaccine vesicle, and from the normal accompanying symptoms, which are not due to impure lymph, but ascribable to the vigor of the lymph, to the idiosyncrasy or special constitutional condition of the subject, or to imperfection in the details of the operation. These are various, and should be carefully separated from those due to other causes. Under this head may be considered the incidental exanthematic eruptions. The second group considers diseases (chiefly of a septic nature) which find a place in the wounds subsequent to the operation, and these are in many respects the most formidable, and are for the most part quite preventable. They are mainly responsible for the ill-repute which vaccination has earned with many people. Among these diseases may be cited septicæmia, pyæmia, tetanus (rare), erysipelas, cellulitis, gangrene, ulceration, contagious impetigo. The views of Hutchinson in regard to antiseptic precautions are regrettable. It is the duty of the vaccinator to take all possible precautions. The last group comprises diseases inoculated with vaccinia at the time of the operation. By using pure humanized or bovine lymph and insistence upon clean instruments we have almost complete immunity against disaster. Syphilis may be communicated, and syphilitic infants which appear to be perfectly healthy may be the source of infection. It is doubtful if leprosy can be thus inoculated. Although the inoculation of tuberculosis is a possibility, it must be a rare one. In subjects specially predisposed to certain diseases it is possible that these will be excited to activity. These are eczema, urticaria, very rarely psoriasis, and lichen urticatus.—*Ibid.*, p. 492.

Grindelia Robusta.—Dott Luigi D'Amore has made an elaborate laboratory study of this drug. He finds that in frogs it produces first a paralysis of the higher nerve-centres, then of the inferior. The nerves and muscles preserve their excitability only through direct action upon them, so they at last lose their irritability. With dogs it was found that large doses depress and weaken the nerve-centres after having markedly excited them. With frogs, when the drug is applied to the heart, there are a slow and progressive diminution of the beat and a lengthening of the systole; sometimes the action is so energetic that there is a rapid diminution of the number of beats and arrest of the heart in systole and with an inexcitable myocardium. With warm-blooded animals the phenomena which it produces may be ascribed to an

exciting action upon the bulbar centre of the pneumogastric, which, when a large dose is introduced at one time into the circulation, appears to be paralyzant. The effects upon blood-pressure are that with small doses there is a slight raising, which is more evident with medium doses; but as the amount is increased the pressure gradually and continually falls during the same time that the oscillations are shorter. In its action upon the respiratory system we have the most interest, for here we find the most extensive use of the drug. Experiments show that when its effects on the pneumogastric are considered, and also its power of contracting bronchial muscles and its action on the heart, that it is likely, in proper doses, to be of value as a remedy for the symptom of asthma. When in addition we bear in mind that the drug contains an active principle, likely a terpene, which benefits the associated catarrh, the clinical use of the drug has a scientific foundation. So far as its effect on bodily temperature exists it apparently possesses a paralyzing action on the thermogenic centre. The secretions are changed as follows: the urine is increased by small and diminished by large doses, partly from changes in blood-pressure and partly from direct action on the renal epithelium. The saliva and bile are increased. Both urine and saliva are of greenish tinge.—*Giornale della Associazione Napoletana di Medici e Naturalisti*, 1896, Puntata 5a e 6a, p. 331.

The Treatment of Acute Broncho-pneumonia in Children.—Dr. Legendre states that fresh air in the sick-room is important, and water should be kept boiling to which antiseptic substances should be added, as carbolic acid, tincture of benzoin, or eucalyptus leaves. The decubitus should be frequently changed; in the case of larger children they should be kept in a half-reclining posture. During the active period nauseating drugs, as the antimonials (kermes mineral and tartar emetic), senega, and ipecac; stupefacients, as aconite and opiates; sudorifics and diuretics, as ammonium acetate and jaborandi, should be avoided. Blisters should never be used. The therapeutic indications are based upon the congestive forms of asphyxia or upon the cardiac paralyses, or when there are nervous symptoms—delirium, convulsions—or when there is insufficiency of nutrition. To prevent active hyperæmia cold-packs over the chest are employed until the number of respirations falls one-fourth, one-third, or even to one-half of their former frequency. For cardiac paralysis caffeine holds first rank, given hypodermatically, as often and in as large doses as is necessary, avoiding cerebral excitement, headache, and insomnia by dividing the doses. Next comes digitalis, slow in its action, but more lasting. Sparteine and strychnine are useful for combating weakness, as is also alcohol in its various forms.—*Bulletin Général de Thérapeutique*, 1896, 6e liv. p. 269.

The Effect of Massive Intravenous Injections of Simple and Compound Saline Solutions.—MM. F. J. Bosc and V. Vedel state that distilled water is harmful when injected into the veins, even in small amounts, causing bloody evacuations, globular lesions, and hemorrhage. It should be rejected as a vehicle for any substance intended for intravenous injection. Ordinary water is not of a toxic character. It gives rise to an abundant diuresis without hæmaturia or albuminuria, a slight elevation of temperature, and its

harmful action upon the red globules is but slight. It can then, *à la rigueuer*, be introduced into the vessels, alone and in large doses. Of simple saline solutions it may be stated that they can be employed on condition that triple the amount of sodium chloride in the blood is not surpassed. These injections of 5 to 7 *per mille* can be introduced at the rapidity of ¼ to 1 ounce per minute to doses of 1 to 3½ ounces for each pound, and at temperatures ranging from 102° to 68° F. These are entirely harmless, temporarily slowing the respiration, accelerating the heart, but not changing the blood-pressure. They elevate the rectal and peripheral temperature about three and one-half degrees, a true febrile attack, and producing within an hour abundant discharge of clear, non-albuminous, non-saccharine urine. These effects are independent of the temperature of the liquid and the rapidity of injection, within the limits given above. The solution of seven is preferable to that of five *per mille*. The solution of sodium chloride and sodium sulphate, equal parts (seven *per mille*), does not present any difference in results from those of the simple saline, and therefore is not superior to it. The simple saline solution of the above strength possesses the minimum of harmful effects and the maximum of physiological effects, and should be the solution of choice for massive intravenous injections.—*Archives de Physiologie*, 1896, No. 4, p. 937.

Nutrose vs. Liebig's Meat-peptone.—Dr. Bornstein makes the following comparisons: 1. Nutrose (casein-sodium) is of pleasant taste; the peptone tastes badly. 2. Nutrose is completely absorbed in the intestine without producing symptoms of irritation; peptone irritates so that generally it cannot be used for a long time. 3. Nutrose is not more expensive than peptone. 4. Nutrose is completely utilized—better than meat; peptone is of itself of less value than meat.—*Therapeutische Monatshefte*, 1896, Heft 10, S. 561.

Kola during Labor.—Dr. F. Gundrum administered a teaspoonful of the fluid extract every hour during the labor of a patient who had recently suffered from an obstinate malarial fever, during which she had undergone a rather severe uterine hemorrhage. Owing to an irritable stomach but little food had been taken during her illness, so that she was in a condition of great weakness when labor began. The progress of the parturition was easy, and there was an entire absence of weakness and exhaustion.—*Therapeutic Gazette*, 1896, No. 12, p. 802.

The Treatment of the Vomiting of Tuberculous Patients.—M. Mathieu notes the importance of checking this grave symptom, which so seriously interferes with nutrition. Since these patients vomit because they cough, the plan of preventing the former by treating the latter symptom has resulted in giving opiates, cocaine, or bromides, and in making various revulsive or sedative applications to the epigastric region, as blisters, actual cautery, ether-spray, belladonna, or cocaine-plasters. With any of these, failures are more frequently encountered than success. Since these patients vomit because the food excites the gastric mucous membrane, which has the same nervous supply—the pneumogastric—as the lungs, therefore the gastric mucous membrane is the starting-point of the expulsive reflex. Two remedies are

cited. Chloroform-water is diluted with an equal part of ordinary water and given by the mouth in doses of from two to four teaspoonfuls every ten minutes. The other is three grains of menthol dissolved in five ounces of menstruum, of which the same dose as above is given at intervals after meals. Besides these, small portions of ice may be swallowed immediately after the meals. In the majority of instances the employment of these methods has been followed by success.—*Bulletin Général de Thérapeutique*, 1896, 23e liv. p. 720.

The Medical Treatment of Cancer of the Stomach.—M. ALBERT ROBIN, for awakening the appetite, uses a decoction of the bark of white condurango (15 to 250, boiled to 150) in dessertspoonful doses before each meal, or the tincture of nux vomica or ignatia in five or six drop doses before meals. After meals a capsule of ammonium chloride, two and one-half grains; sodium bicarbonate, four grains; and Dover's powder, one and one-half grains, is given. For assisting digestion during the meal a glassful of hydrochloric acid in water (1.66 to 1000) is sipped; and in the midst of the meal is taken a powder consisting of pepsin, seven and one-half grains; maltine [diastase], one and one-half grains; and pancreatin, the same quantity. For diminishing the fermentation, sulphur, sublimed, washed or precipitated, two and one-half to three grains; or a dessertspoonful of ammonium fluoride in water (1 to 300), during the meal. Or at its termination, in a little water, one and one-half grains of granulated naphtol may be given. If there is very acid vomiting, severe pain, or stenosis, lavage is useful.—*Bulletin Général de Thérapeutique*, 1896, 11e liv. p. 481.

The Treatment of Infantile Diarrhœas.—DR. LESAGE relies upon (1) an absolute diet of milk, even sterilized. (2) For drinking-water (Vals.), albumin-water, or water medicated with lactic acid, antipyrin, tannigen, benzonaphtol, or bismuth salicylate. (3) If the disease is serious, subcutaneous injections of artificial or blood-serum should be used. The former are of two kinds: (*a*) of massive dose or (*b*) of small dose. If the former, either sodium chloride in sterilized distilled water (7 to 1000), or sodium sulphate, 10; sodium chloride, 5, in sterilized distilled water, 1000; may be used in dose of an ounce three to six times daily. The purpose of these injections is to introduce into the circulation a large quantity of liquid to make up for losses by the intestine. Besides, they have a stimulant effect. The indications for their use are an algid type of infection and abundant loss of water. Of the second type are the small injections, for which the indications are emaciation, cachexia, atrophy with chronic debilitating diarrhœa. Two subcutaneous injections each day are given, to the amount of a drachm of the following solution: carbolic acid, 1; sodium chloride, 1; sodium phosphate, 1; sodium sulphite, 1; in distilled water, 100. The massive injections are contraindicated in manifest or latent tuberculosis. Provided that the viscera are healthy and lymphatic ganglia are normal, the small injections are indicated for all cachectic infants. In obtaining a specific blood-serum it is necessary to take into consideration the results of previous investigation, which, in brief, show that the agent of fermentation in milk is the bacterium coli, and it is this micro-organism which produces the virulence; as for the

other microbes, not one possesses virulence, and all are harmless, even in large doses. In diarrhœa due to milk the bacterium coli isolated from it has the same virulence as the bacterium coli from milk, and the other microbes of these diarrhœas are harmless. Without going into particulars, it is stated that with the bacterium coli isolated from virulent milk and from the diarrhœa of nurslings, we can obtain by treatment of an animal (the ass) a serum which possesses particular specific qualities which the normal blood-serum does not. The same results have not been obtained in immunizing the animal with cultures of the virulent bacterium coli of the adult or with the normal bacterium coli of the nursling. Fifty-two children affected with serious infantile diarrhœas have been treated by an injection of a drachm of the serum, which may or may not be repeated upon the second day. In twenty-six the morbid phenomena ceased within forty-eight hours; in fourteen there was a diminution of infection and of diarrhœa, and after five or six days health was restored. In twelve instances the result was *nil*. In all cases where the diarrhœa was green, acid, bilious in character, the injection immediately caused the color to disappear. This fact is important, because it shows that the serum acts upon the liver, with limitation of the superactivity of that organ and the diminution of the amount of bile.—*Revue de Thérapeutique Médico-chirurgicale*, 1896, No. 24, p. 745.

The Use of Diastatic Ferment.—Dr. H. Leo recommends the use of taka-diastase in gastric hyperacidity, both when uncomplicated and in connection with ulcer. In these instances the starchy foods should be taken at the commencement of the meal, and when taken with the above-mentioned remedy the conversion of the starches will be continued in the stomach for a long time. He has noted that in instances of hyperacidity the pain has been, by this method, markedly diminished. In addition, the obstinate constipation so often associated with this symptom has generally disappeared.—*Therapeutische Monatshefte*, 1896, Heft 12, S. 635.

Death following the Administration of Nitrous Oxide.—Dr. H. A. Hare reports an instance, not as death due to the direct influence of nitrous-oxide gas, but as illustrating the fact that the morbid rise of arterial pressure which is produced by the administration of this drug during the period of anæsthesia may cause the rupture of a bloodvessel in persons who have a tendency to apoplexy. A man between fifty and sixty years of age, who had previously taken gas without ill effects, took the ordinary quantity for the extraction of two molar teeth. He returned to consciousness with the usual rapidity, began to cleanse his mouth, when he remarked that his right hand felt numb, and that this numbness rapidly extended up his arm and to his side and leg. He became partially unconscious within a few minutes, and shortly after, comatose, dying about twelve hours later.—*Therapeutic Gazette*, 1896, No. 12, p. 801.

Salol in the Treatment of Acute Angina in Children.—Dr. Carron de la Carrière states that the peculiar properties of this drug are antiseptic, generally analgesic, with selective action upon the larynx. It relieves the pain and dysphagia, improves the physical signs, prevents abscess-formation,

and shortens the duration of the disease, especially if administered soon after its onset. The daily dose is seven and one-half grains for each year to the fourth, thirty grains to the eighth, and forty-five grains to the fifteenth year. The only contraindication to its use is a pathological condition of the kidneys, which is exceptional in children. The formula is: salol, 2; oil of sweet almond, 4; powdered acacia, 4; syrup, 30; distilled water, 60. Peppermint, orange-flower, vanilla, or cherry-laurel water may be added for flavoring. The daily dose should be divided into three parts and taken at equal intervals. Its use should be suspended when the color of the urine becomes darker. In case of threatening abscess the dose should be pushed until this change appears, which is evidence that the organism is well under the influence of the drug.—*Journal des Praticiens*, 1896, No. 49, p. 772.

The Antitoxic Action of Sodium Hyposulphite in the Presence of the Dinitriles.—Drs. J. F. Heymans and Paul Masoin cite the demonstration by Lang that this drug possesses an antidotal action in the presence of potassium cyanide, quite likely through the transformation of the CN group into CNS. From elaborate experimentation they conclude that when the dose of malonic nitrile ($CN—CH_2—CN$) is not greater than nine times the fatal dose, no matter by what route it is administered nor what is the duration or severity of the poisoning, provided that the respiration shall persist a few minutes after the administration of the antidote, we can save the life of the patient by giving a sufficient dose of the sodium salt, and cause, as if by magic, within five or ten minutes, the disappearance of the respiratory and circulatory symptoms. So far as concerns cyanogen ($CN—CN$), there is an antitoxic action which is real, but which shows itself within narrower limits than with the above-mentioned substance. With succinic nitrile ($CN—CH_2—CH_2—CN$), the superior limit of antitoxic power is about ten times the fatal dose. With pyrotartaric nitrile ($CN—CH_2—CH_2—CH_2—CN$) the results are similar so long as the quantity of the antidote is sufficient, so that it shall be retained in the organism so long as is the poison.—*Archives de Pharmacodynamie*, 1896, Fascicule 1, p. 77.

The Treatment of Infectious Endocarditis.—Dr. H. Huchard hopes that in the future a treatment will be found which is directed toward the microbe. In the meantime the toxins must be eliminated by the kidneys, and for this purpose a milk-diet and various diuretics, as theobromine or caffeine, may be ordered. Especially to be avoided are those drugs capable of closing the kidney, as antipyrin, which has the further inconvenience of interfering with the cardiac contractility, or acetanilid, which may cause cyanosis, or thallin, which only relieves the fever, as if that were the cause of the severity of the disease. The heart should be strengthened by digitalis, hypodermatic injections of caffeine, camphor in oil, sparteine, or of ether. Here digitalis has a double action when used in moderate doses; it lessens the exaggerated action of the heart and thus, to some extent, prevents the detachment of septic or simply obliterating emboli.—*Journal des Praticiens*, 1896, No. 43, p. 673.

MEDICINE.

UNDER THE CHARGE OF

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The Leucocytes in Pernicious Anæmia.—In reporting a case of pernicious anæmia that recovered under the use of salol, along with ferratin, bone-marrow, oxygen, arsenic, iron protoxalate, and quinine, DIEBALLA calls attention to the importance of examination of the leucocytes in this disease (*Zeitschr. f. klin. Medicin*, Bd. 31, p. 47). In the case reported, a full description of which must be omitted here, the leucocytes were reduced in number, the reduction being due to relative decrease of the polynuclear cells. From the fact that reduction was only moderate and eosinophile-cells were present in normal proportion, the author concluded the spleen and bone-marrow were not excessively degenerated. That the various kinds of leucocytes vary in proportion in different cases of pernicious anæmia has been shown by cases previously reported. Usually the eosinophiles are much reduced, but in another case of the author's they were present to the extent of 8 per cent. Although the author's conclusions are not all warranted by present knowledge of the development of the blood, his paper is important in pointing out the need of a more careful examination of the white blood-corpuscles in pernicious anæmia, in the first place, with a view to increasing knowledge; in the second, for prognostic purposes, should the results be confirmed. The successful outcome of the case is ascribed to the action of the salol on germs in the intestinal canal, and the stimulating effect of the iron, etc., on the blood-forming organs.

The Degeneration of Leucocytes in Leukæmia and Severe Anæmias.—GUMPRECHT has performed a valuable piece of work in studying the degeneration of leucocytes in various diseases. After a *résumé* of the rather scanty literature of the subject he describes some experiments on the degenerations found in tissues kept for some time post mortem, and formulates some general statements regarding cell-degeneration. The occurrence of pathological degenerations of leucocytes in the blood is then taken up. In normal blood and in mild anæmias and chlorosis little or no evidence of nuclear degeneration is seen, for the reason, no doubt, that the results of normal break-down are rapidly swept out of the circulation. In leukæmia, both acute and chronic, and in pernicious anæmia, degenerations are common. In acute leukæmia as many as 11.5 per cent. of leucocytes were degenerated, though usually the proportion was less than half of this. In one case of pernicious anæmia there were 10 per cent., but in other cases not more than 1 or 2 per

cent. All kinds of cells show the degeneration, but the lymphocytes and myelocytes are the most important. Changes in the polynuclear cells are not so common in leukemia as in severe anæmias. Various forms of degeneration are found, such as swelling and vacuolization of nuclei, hypo- and hyperchromatosis, the various changes being illustrated by drawings. The degenerations are readily studied in cover-glass preparations made in the usual way, it being easy to see that they are not artefacts. The relation of the degeneration of leucocytes to increased excretion of nuclein-products in the urine is alluded to.—*Deutsches Archiv für klin. Med.*, Bd. 57, p. 523.

Sinus-pleurisy.—KOLL (*Deutsches Arch. f. klin. Med.*, Bd. 57, p. 596) reports a number of cases of pleurisy having certain peculiarities not often described. It is somewhat remarkable that about thirty cases were observed in one year and only occasional ones later. The disease appears as a dry pleurisy, almost always in the anterior and lower pleural sinus. The disease begins usually with slight fever and other general symptoms, sometimes with chill, without apparent cause. In two cases there was articular or muscular rheumatism. It was never associated with such diseases as nephritis or diabetes. In two cases the onset was slow; in one the patient stated he had a similar attack five years before. The subjective symptoms often suggested an acute or chronic disease of the stomach. There was a painful spot just below the ensiform, increased by eating, by pressure, and by forced inspiration. About a third of the cases had eructation and vomiting. One patient, admitted with the diagnosis of gastric ulcer, was almost unable to take nourishment on account of these symptoms. Nearly all the patients complained of pain on both sides of the sternum. There were at times palpitation of the heart and frequent pulse. In all cases there was fine friction over the region of the pleural sinus in the heart-region and along the lower lung-border, usually at the end of inspiration and beginning of expiration. The course of the disease suggested the existence of an infection; the spleen was in many cases enlarged. In a case following arthritis mitral endocarditis also appeared, and in another case acute endocarditis developed without symptoms of rheumatism or other discoverable cause. The course of the disease is chronic and irregular and subject to exacerbations. The subjective symptoms subsided in eight or ten days, but the physical signs remained as before. Salicylic acid, phenacetin, etc., had no effect. The author believes this form of pleurisy has not been described before. He mentions the points of resemblance and difference as compared with the indurating, circumscribed pleurisy of von Ziemssen, and with diaphragmatic pleurisy.

Osteomalacia.—SENATOR reports an interesting case of osteomalacia. The patient lived near Frankfort-on-the-Oder, where osteomalacia is rare. The symptoms began after the third and last pregnancy, in 1888, with weakness and pain, the latter soon becoming permanent. There was pain over all the large nerves, in the ovarian regions and in the muscles. The vertebral column was strongly curved; some of the bones were sensitive to pressure. The pelvis was osteomalacic. The patient improved very much. Thyraden and ovarin were used at different times, and although Senator does not think the improvement was due to the treatment, some interesting facts regarding

these substances were obtained. Under both remedies the quantity of urine and the nitrogen, phosphates, and lime in the urine were increased. The alloxan bodies were increased under ovarin. Lactic acid was never found. The alkalinity of the blood (one examination) was much increased. The blood showed nothing of note. The feces, under the administration of ovarin, contained more lime than before. The increase in the excretion of lime during improvement is especially important, because Fehling found the same thing in cases improving after castration.

The influence of the ovarin on the tissue-change of the patient led Senator to make experiments on other diseases. In climacteric disturbances he had favorable results. As a diuretic ovarin was useful only in some cases of nephritis; not at all in heart or liver cases. There was no effect in Basedow's disease. The tablets were well borne and the observations encourage further experiments.—*Münch. med. Woch.*, 1897, No. 3.

A New Symptom of Stenosis of the Trachea.—The symptoms of tracheal stenosis are few and not always certain. A new one recently described by AUFRECHT (*Centralblatt für inn. Med.*, 1896, No. 1) will therefore be looked for with interest. If the patient is examined with the stethoscope over the trachea, just above the sternum, the normal loud bronchial breathing usually heard in both phases of respiration is either replaced by a short, soft breath-sound or else is quite inaudible. This has been found by Aufrecht three times, twice in cases of mediastinal cancer growing into the trachea and once in a case of gumma compressing the trachea. The explanation of the phenomenon is as follows: in the normal condition the air passing from the narrow glottis into the wide trachea causes bronchial breathing on account of the formation of eddies. For this a certain rapidity of the air-current is necessary, and this is furnished under ordinary conditions by the even calibre of the trachea. If the latter is narrow, so that the lumen approaches that of the glottis, the eddies coming out of the glottis must become weaker and so produce the modification described.

Cancer of the Stomach.—As the result of the examination of forty-two cases of cancer of the stomach, HAMMERSCHLAG gives some data useful in the early diagnosis of cancer of the stomach. "If a number of examinations during a period of three or four weeks show a constant absence of free hydrochloric acid, albumin digestion reduced below 15 per cent., much lactic acid, and numerous long bacilli, and if no improvement occurs in this time, the diagnosis of cancer can be made almost with certainty, even if tumor and cachexia are absent. The recognition of a loss of motor power, soon appearing and increasing rapidly, and the finding of small quantities of blood in the stomach-contents, are also important. The diagnosis is not certain, however, for in dilatation without cancer lactic acid may be present and the chemical conditions in cancerous stenosis of the pylorus vary according to the previous occurrence or absence of ulcer. Neither deficient HCl nor marked loss of peptonizing power is peculiar to cancer. For the production of lactic acid three factors are necessary: absence or marked reduction of HCl, great reduction of ferments, and motor insufficiency. In such cases histological examination shows disappearance of the specific glandular

elements in foci, the cells being replaced by cylindrical epithelium. The demonstration of the constant occurrence of the intense lactic-acid formation warrants the conclusion that total or partial atrophy of the peptic glands and motor insufficiency exist, a combination seen earlier and more frequently in gastric cancer than in any other condition."—*Archiv für Verdauungskrankheiten*, Bd. ii. H. 1 and 2.

Epidemic of Cowpox, with Infection of Milkmaids.—Dr. L. Kaempffer, of Wenreuchen, reports an epidemic of cowpox. The disease first appeared in a cow that had been on the premises two years, without any discoverable source of infection. In a short time all but thirty out of ninety cows were affected. The pocks were only on the udders, from two to six on each teat, and being broken in milking did not follow the complete course, but became painful and sluggish ulcers. Sixteen milkmaids were engaged on the place, between the ages of sixteen and twenty-nine, all revaccinated. Ten of these acquired cowpow, without regard to the length of time after revaccination. The incubation in most cases was from three to four days; in two nine or ten days. General symptoms occurred only in cases with complications, such as phlegmon. In six cases there was only one pock in each; in the others two, three, five, and six, respectively. The pocks appeared especially on the flexor aspect of the fingers or the back of the hand, locations easily explained by the exposure of the hand in milking. The process of development of the pocks was practically the same as in vaccination, except that the time was shortened to twelve days and the cicatrices were not so deep. Experimental inoculations were not successful, the subjects ridding themselves of the vaccine.—*Deutsche med. Wochenschrift*, 1896, No. 50.

Amœburia.—The following cases are interesting in connection with the obscure subject of hæmaturia:

Wijnhoff (*Nederl. Tijdschr. u. Geneeskunde*, 1895, iii. p. 107) was consulted by a woman, aged thirty years, who passed bloody and purulent urine after attacks resembling those of renal colic. In the urine were numerous colorless bodies, identical with amœba coli. These amœbæ appeared after every attack of colic or strangury, but in the intervalss only encysted bodies and a few "ring-forms" were present. In three other cases amœburia occurred simultaneously with attacks of strangury and vesical or renal colic. In these cases the urine was cloudy and contained numerous pus-corpuscles. The formation of daughter-cells out of the large amœbæ could be observed. The protozoa were most numerous in the acme of the attacks, so that the author believes in an etiological relation between the parasites and the disease.

Zeehuisen, in abstracting this report (*Centralblatt für in. Med.*, 1896, No. 52), mentions a case he has seen, in which a medical student had an almost painless hæmaturia with numerous blood- and hæmoglobin-casts in the urine, and also numerous amœbæ. After the attack the ring-shaped amœbæ were still present.

Alimentary Albumosuria and its Value in the Diagnosis of Intestinal Ulceration.—Chvostek and Stromayr (*Wiener klin. Wochenschrift*, 1896, No. 47) have made some investigations that promise valuable aid in the diag-

nosis of ulcers of the intestine. The experiments were based on the older observations regarding albumosuria (formerly called peptonuria) in ulcerative diseases of the intestinal canal. The authors concluded that the negative results in many of these cases were probably due to the fact that albumose was absorbed in quantities too small to be detected. They therefore gave to persons with various diseases comparatively large quantities of albumose, such as 40 to 60 grammes of peptone (*peptonum siccum*, Germ.) or somatose. Usually cases were selected in which there was no albumin in the urine, or at least no albumose. The urine was examined before the ingestion of the albumose, and at short intervals after, by the methods of Devoto and Salkowski. It was found that in the cases with ulceration of the intestine albumose could be detected; whereas in persons without ulceration, even large quantities of albumose could be taken without appearing in the urine. It is evident that in some cases of intestinal ulcer there may be temporary or permanent causes which prevent the absorption of the albumose, so that negative results cannot be looked on as proving the absence of ulcer. The cases now reported show the great value of the method, a diagnosis being made in several when there were no symptoms of ulcer, and confirmed post mortem. The subject offers an interesting field for control-investigations, for, as the author remarks, the number of cases they were able to examine was not enough to show all the possible results of such measures.

The Early Stage of Diabetes Mellitus.—M. Loeb (*Centralblatt für inn. Med.*, 1896, No. 47) calls attention to the fact, often overlooked, although the observation of almost any case of chronic diabetes should suggest it, viz., that in a large number of cases of diabetes small quantities of sugar may be found in the urine for long periods, sometimes years, before the excretion of larger quantities and the ordinary subjective symptoms are recognized. Loeb had occasion to make repeated examinations of the urine in a number of cases, including several hereditary diabetics, and so had the matter brought to his attention. As the author remarks, Prof. Ebstein considers all cases of protracted glycosuria diabetic. Loeb's article emphasizes the fact, well known but often neglected, that diabetes can be discovered earlier than otherwise if the urine of persons with even the most trifling symptoms be examined for glucose.

The Influence of Carlsbad Water on Metabolism.—V. Ludwig (*Centralblatt für innere Medicin*, Nos. 45 and 46, 1896) studied the effect of Carlsbad water on metabolism in two cases. The first experiment he carried out on himself and the second on a colleague. The diet was regulated for each according to the body-weight, and exactly the same amount of food taken each day throughout the experiment. The latter was divided into two periods, that before and that during the drinking of the Carlsbad water. The total nitrogen, chlorides, and phosphoric acid were estimated in the food ingested and in the urine and feces eliminated. In addition, the uric acid and alloxur bodies (uric acid and xanthin bases) were estimated in the urine. In four or five days, after a nitrogenous equilibrium had been established, each began to drink 1.5 litres of Carlsbad water daily. This was continued for nine and eight days respectively. Ludwig found that the water

had practically no effect on his own metabolism. In the case of his colleague there was an increase of 33.2 per cent. in the total amount of phosphoric acid eliminated, and the amount in the feces was increased at the expense of that eliminated in the urine. The alloxur bodies were slightly diminished in the urine during the water-period, whilst the amount of nitrogen eliminated in the feces was considerably increased. Ludwig attributes these changes not to any effect of the Carlsbad water on the organism, but to the fact that during the drinking of the water his colleague had suffered from diarrhœa. He does not believe that Carlsbad water itself rapidly produces a loss in body-weight, as is claimed for it, because his own weight and that of his colleague considerably increased while they were drinking it.

Kubisagari, an Endemic Paralytic Vertigo of Japan.—MIURA (*Mitteilungen der med. Fac. der Kaiserl.-Japan Univ. zu Tokio*, 1896, Bd. iii. No. 3) gives an admirable report on this disease, prevalent in northern Japan. It occurs especially in the warm season from May to October, in villages, among farm laborers of both sexes and all ages; comes on in paroxysms, and is characterized especially by the following symptoms: ptosis, dimness of vision, diplopia, hyperæmia of the optic papilla and its vicinity; motor disturbances of the tongue, lips, muscles of mastication, and rarely those of the gullet; paresis of the muscles of the neck, body, and extremities. Paresis of the neck-muscles and ocular symptoms are most common. There are at times change of disposition, increased-tendon reflexes, increase of the tears, nasal mucus, and at times the saliva. In the intervals the patients are either free from symptoms, or, if the attacks have been severe, have a mild degree of ptosis. This may be simulated by a conjunctivitis or trachoma, common among the subjects of the disease. Patients in whom the attacks are easily brought on, as by working in a stooping posture, may have weak neck-muscles, easily tested by having the head raised against a weight. A third symptom in the interval is increased tendon-reflex, never, however, so strong that ankle-clonus is present. In the intervals the patient complains of weakness and depression, loss of appetite, headache, etc.

Miura shows the points of resemblance of the disease under consideration with neurasthenia, Erb's asthenic bulbar paralysis, and Westphal's periodic or paroxysmal paralysis, as well as the essential differences. It most resembles, as he shows, the disease described by Gerlier, of Ferney, in 1886, under the name "vertige paralysant." This affection is epidemic in certain parts of Switzerland, Collex, near Ferney, being its chief seat. It is seen also in France. (Gerlier: "Une épidemie de Vertige paralysant." *Revue méd de la Suisse Romande*, 15 December, 1886, p. 769; 15 January, 1887, p. 5. Similar cases were reported from Switzerland by Dr. C. David, Dr. Haltenhoff, and others.) A number of case-histories quoted by Miura from the Swiss observers prove the identity claimed, though there are minor points of difference in the accounts of the Swiss authors among themselves as well as in these as compared with that of Miura. The latter gives an interesting account of the possible explanations of the chief symptoms. The most plausible explanation, he thinks, is an exaggerated tendency to fatigue on the part of the nerves and muscles. Localized fatigue is, of course, common in all occupations; the rice cultivator or the weeder has to strain his eyes,

hands, neck, back, and legs at the same time. In Japan and also in Switzerland the disease is attributed by the peasants to evil spirits. This explains why it was so long unknown to physicians, having been treated by charms, etc. The idea of a malarial affection was early entertained. Facts that throw some light on the real cause of the disease are as follows: farm laborers, especially those who work much with cattle and horses or who sleep in stables, are often affected, while well-to-do farmers escape. Dwellers in the city are rarely affected, or, if at all, those who work hard, as "jinrikisha" men. The disease occurs as a house-epidemic or sporadically, always in the warm season, or the change from warm to cold, or the reverse. Both in Switzerland and Japan the laborers work from early in the morning until night, with short pauses. The consumption of sour wine or beer seems to favor the development of the attacks. In Japan, as in Switzerland, the farmers live under the same roof with the live-stock, often without any partition. The stalls in these houses are rarely cleaned. Inheritance is supposed to be a factor; but, as Miura points out, all the patients are exposed to the same causes. "Kubisagari" houses are known, but infection from person to person is not observed. Pregnancy seems to check the attacks in some cases. Miura found no evidence of malaria in the blood in his cases, and no other blood-change. Inoculations and cultures could not be made, but an infectious agent can hardly be doubted.

As regards treatment, prophylaxis is most essential, the precise needs being stated in full by the author. General tonic treatment is useful.

A Peculiar Venous Phenomenon.—SCHLESINGER (*Wiener klin. Wochenschrift*, 1896, No. 52) describes in a preliminary communication a curious condition of the veins. This consists in a rigid contraction of the walls of the veins, coming on at times and disappearing again. In some cases the contraction could be brought on by cold, by massage, or by a mild faradic current. Heat caused the contraction to subside. An excised vein showed no abnormality of the walls or its nerves. All the patients who presented this phenomenon were men, seriously ill; but there was no apparent relation between the primary disease and the venous change. Phlebosclerosis can be distinguished from this condition by continued observation; thrombosis by demonstrating the filling of the vein. Prof. Weinlechner has often noticed a similar contraction in the veins in varicocele operations.

Absence of the Pupil-reflex in Hysteria.—KARPLUS (*Wiener klin. Wochenschrift*, 1896, No. 52) calls attention to the absence of the pupil-reflex in attacks of hysteria. Aside from an observation of Féré this does not seem to have been noticed before. Karplus's observations were made in the clinic of Prof. Krafft-Ebing, who confirmed the diagnosis and the fact of the absent reflex. The latter was also confirmed by the ophthalmologist Bernheim. The observations were made by having the lids held apart, the eye being illuminated by a hand-lamp and the cornea protected by salt-solution. Thus the eyes could be observed for many minutes. The pupils were wide open and motionless for as much as twenty seconds. These observations, if confirmed, will make it necessary to use with reserve the absent pupil-reflex as a negative pathognonomic sign in suspected hysteria.

Idiopathic Hemorrhage of the Kidney.—KLEMPERER has called attention to cases of hematuria in which cystoscopic examination shows that the blood comes from the kidney, but without other evidences of renal disease. He calls this "hemorrhage from healthy kidneys," believing in an analogy with the process in menstruation and vicarious menstruation. [In the latter process it is rather arbitrary to assume the organs are healthy, and even in the menstruating uterus, though it may be healthy, there is a process which can hardly be considered possible of imitation in a healthy kidney. Klemperer, however, has seen two cases of vicarious menstruation in the stomach, the organ in both cases being healthy.] Surgical literature contains accounts of healthy kidneys removed for hemorrhage, and Dr. Elbe has compiled these accounts in his thesis under Leyden's direction. The cases hitherto reported have been chronic, but Leyden has taught for years that there are acute cases. Two of the latter kind are mentioned by Klemperer. In one, an officer not accustomed to that exercise, took a long horseback-ride. On dismounting he passed black urine. In a few hours the color became lighter, but blood was passed for several days. The patient, after seven years, remains well. In the other case a bicyclist passed bloody urine after a long ride. The hemorrhage was not repeated. Chronic cases, as the result of hemophilia or of angioneurotic conditions, are rare. To the hitherto unique case of Senator, Klemperer adds two hemophilic cases and two of the angioneurotic variety. In the discussion following Klemperer's paper Nietze and Fürbringer called attention to the importance of time in the diagnosis of essential renal hemorrhage, as the symptoms of tumor other than hemorrhage may long remain latent.—*Münchener med. Wochenschrift*, 1896, No. 49.

Disease of the Spinal Cord in Whooping-cough.—BERNHARDT (*Deutsche med. Wochenschrift*, 1896, No. 50) reports the following rare case: a five-year-old girl, previously well, got whooping-cough. About the tenth day, immediately after a severe paroxysm of coughing, the extensors of the hip, knee, and ankle became contracted so that walking and standing were impossible. There was no fever and no sign of cerebral disease. The upper extremities were not affected. The knee-jerk was exaggerated; there was strong contraction of the abductors of the thighs; there was plantar flexion; ankle-clonus was easily produced. There was no muscular atrophy. A month later Bernhardt found the conditions as described. There was hardly any voluntary motion in the legs. Sensibility to touch, temperature, and pain was lessened. There was no incontinence of urine or feces, but the expulsion of urine seemed somewhat feeble. A month later the patient could move the legs slightly and bend the knees, but spastic contraction and increased reflexes persisted. The general condition, aside from the moderate difficulty in urination, remained good. Improvement continued, so that in about five months from the beginning the child was able to walk. Six months later, after double parotitis, walking became difficult, and the spastic gait was plainly apparent. There was also difficulty in urinating. These symptoms again subsided. At present the patient is healthy, but has difficulty in urinating and at times rectal tenesmus. The feet have a tendency to turn in and the right leg becomes weak after a long walk. The treatment consisted in rest, warm baths, potassium iodide, and weak galvanic currents.

Bernhardt is inclined to ascribe the disease to an infectious myelitis of the lower dorsal and upper lumbar cord. The probability of a meningeal hemorrhage and of hæmatomyelia is discussed, and the analogies for a meningeal hemorrhage, such as hemorrhage from the ears in the scleræ and the skin in whooping-cough, are mentioned. Though cases like the one reported may recover spontaneously, the prognosis is not always good. A useful bibliography is appended to this interesting article.

SURGERY.

UNDER THE CHARGE OF

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Laparotomy and Suture for Gastric Ulcers.—MORSE (*British Medical Journal*, February 13, 1897) reports three cases of perforating gastric ulcer in which he performed laparotomy with suture of the stomach and a thorough washing out of the peritoneum. Two of the cases recovered. In both the operation was performed within five hours after the perforation had taken place. The operation consisted in an incision, three and one-half inches long, one inch to the left of the median line, commencing at the costal cartilage and extending downward toward the umbilicus. It was made to the left of the median line in order to allow the stomach to be more easily brought out. The perforation was closed by means of Lembert sutures, which penetrated the serous and muscular coats; two rows were inserted approximating areas of the stomach two inches wide. The peritoneal cavity was washed out with boiled water cooled to a temperature of 105° F.. by the use of siphon-drainage and two long glass nozzles which were passed in all directions, thoroughly cleansing the cavity. There was considerable shock, which was treated by warmth and brandy enemata. Both patients made good recoveries and remained well, with no further sign of gastric ulcer. In the third case the patient died; she was not seen until twenty-four hours after perforation, and, although the same operation was performed, the patient recovered from the anæsthesia severely shocked, with a rapid, hardly perceptible pulse, rapid respiration, and low temperature. She lived only a few hours.

The author says: "The duration of life after perforation of the stomach may be estimated at twenty-four hours; hence the importance of early and distinct diagnosis cannot be exaggerated. The shock following perforation

is severe, and its effects can be observed to increase so rapidly that it is apparent the chances of success are diminishing in direct proportion to the length of time that is allowed to elapse between the occurrence of the injury and its repair by surgical means."

Intestinal Obstruction from an Impacted Gallstone; Recovery.—WILKINSON (*British Medical Journal*, February 13, 1897) reports an interesting case in which intestinal obstruction was produced by a gallstone about the size of a pigeon's egg. The patient had all the usual symptoms of intestinal obstruction without, however, any localizing symptoms. Treatment consisted of copious and frequently repeated enemata of tepid water, alternating with nutrient injections and hypodermatic injections of morphine and atropine (gr. $\frac{1}{4}$ and $\frac{1}{100}$), to allay the excessive pain, a little ice being allowed for thirst. The pulse was 120 to 140, wiry, and occasionally intermittent; temperature 99° F. The tongue was dry and glazed, the abdomen tympanitic and distended, especially in the cæcal region. Nothing was discoverable on palpation and rectal examination. The patient continued in this condition, with some slight amelioration alternating with exacerbations, for eleven weeks, existing, upon the average, on not over three ounces of milk a day. At the end of that time the author was called suddenly to find his patient in a state of collapse, with great pain and straining. A hard mass was felt blocking the rectum; it was removed by pressure through the posterior vaginal wall, and proved to be a gallstone the size of a pigeon's egg, faceted and weighing ℥v gr. xliss. The patient recovered slowly, but completely.

Chylous Cysts of Mesentery.—An interesting case of this rare form of cyst is reported by O'CONOR (*British Medical Journal*, February 13, 1897), the patient presenting the following symptoms when admitted: A distinct swelling was visible in the median line between the pubes and umbilicus. A well-defined, tense, fluctuating tumor was felt, even in contour, movable, and about the size of an ordinary cocoanut. Palpation caused severe pain, so that it was impossible to find the amount of motion. There was absolute dulness on percussion; no thrill was obtained. The tongue was furred, breath foul, temperature and urine normal; other organs healthy; the previous history showed nothing but chronic constipation and asthma.

The patient was anæsthetized and the tumor was found to move freely in all directions; an incision three inches long was made in the median line and directly over the tumor. A cyst presented, having a dirty green color and covered with enlarged veins, resembling a sarcoma. The tumor was lifted out with the mesentery and adherent intestines. The adhesions were so strong that it was impracticable to remove it; it was incised and the contents removed and the margins of the wound sutured to the abdominal parietes by continuous silk suture; the rest of the abdominal wound was closed. The cavity of the sac was packed and healed completely by granulation, the patient making a perfect recovery.

Puerperal Septicæmia Treated by Antistreptococcus-serum, with Recovery.—A case of severe septicæmia occurring after confinement is reported

by CUMMINS (*British Medical Journal*, February 13, 1897); the pulse was quick and the abdomen distended, with a temperature of 103° F. The symptoms became rapidly worse and the temperature rose to 105° F. There were constant vomiting, delirium, hiccough, and a dry, brown tongue; the pulse-rate was 120 to 140. A dark, erysipelatous eruption appeared on the left mamma and spread rapidly over all the trunk. There was a severe rigor, with a rise of temperature to 106.6° F. in the axilla. She was apparently sinking when the injections were given.

The influence of the serum on what was an apparently hopeless case was most remarkable. The general symptoms—vomiting, hiccough, delirium—disappeared rapidly; not so the temperature, which continued a fluctuating course and did not come down finally until twelve days after the serum-injections had been discontinued. The influence of the treatment on the rash was most marked; four days after the first injection it had left the trunk and spread subsequently only two or three inches down the thighs and arms. Additional treatment adopted was quinine in large doses, perchloride of iron, hypodermatics of strychnine, salicin, stimulants, etc., with local antiseptic measures.

Diagnosis and Treatment of Neoplasms of the Liver.—The difficulty experienced in the diagnosis of tumors of the liver makes very valuable the additional knowledge which has been contributed to this subject by TUFFIER (*Gaz. hebdom. de Méd. et de Chir.*, January 28, 1897).

It is impossible in many cases to make a diagnosis without an exploratory operation, and sometimes, with the tumor laid bare before the eyes, it is impossible to form a diagnosis without an exploratory puncture, which has too often proved fatal from the profuse and irrepressible hemorrhage which has resulted.

The author advises, in all cases of doubt, to explore the hilum of the liver to see if there are any enlarged glands present; if present, they show a metastasis from a malignant growth, and puncture is unnecessary; but their absence does not exclude a malignant growth, for if it is a secondary growth the metastasis would not be through the lymphatics, but through the venous channels, and the glands would not be enlarged. Primary cancer of the liver shows metastasis in the glands situated at the hilum. The presence of enlarged glands at this point is therefore in these cases of vast value as a diagnostic sign.

The question of hæmostasis in operations upon the kidney is one of great interest, and is especially so in cases of malignant growths. In the liver there is, in many cases, a marked dilatation of the veins and the tissues about them are friable, so that hæmostasis is very difficult and the means generally employed are of little value, as evidenced by many cases of fatal hemorrhage in operations upon this organ.

The author proposes, as a means of hæmostasis, the temporary digital compression of the pedicle of the liver. He has shown by experiments upon animals that this compression is capable of arresting a severe hemorrhage; and studies upon the cadaver have shown that it can be accomplished easily and safely without producing any damage in the human subject, although clinical experience alone can show how efficacious it will be.

The method of procedure is as follows: the left index-finger is introduced through the foramen of Winslow and compression made by the thumb of all the structures of the pedicle.

Iodoform-calomel in the Treatment of Wounds.—The results obtained in the treatment of wound-surfaces and cavities that are difficult to disinfect or from which it is difficult to eradicate completely a disease are detailed by SPRENGEL (*Cent. für Chir.*, February 6, 1897), who has found this combination especially efficacious in the treatment of tubercular wounds and in tracheotomies necessitated by diphtheritic membranes.

If this mixture is strewn upon a fresh wound-surface, after a short time it assumes a grayish appearance, undoubtedly due to an eschar produced by the caustic action of the drug. In a few days this will fall off and be followed by bright, healthy granulations.

A chemical analysis of the compound produced shows that the action of the wound-secretions forms a biniodide of mercury from the combination, which is a very powerful antiseptic.

The action of this salt of mercury is not the same if applied by itself, as poisoning may ensue, which does not when the two drugs are combined, as the soluble salt of mercury is only produced in proportion to the secretion of the wound.

The author applies the powder by shaking a curetteful into the wound and then rubbing it thoroughly about with a hæmostat covered by a ball of gauze. A previous thorough drying of the wound is necessary, which can usually be accomplished by packing the wound with sterilized gauze and letting it remain for a few minutes. The powder is then applied and the wound packed with gauze. The author finds that the removal of the packing is greatly facilitated by the slough which forms, as there are no adhesions of granulations to it and the patient has little or no pain when the gauze is removed three or four days later.

In tracheotomies the powder is strewn over the inner surface of the trachea, between the diseased area above and the wound and healthy tissue below. This procedure the author has found greatly hinders the spread of the disease and prevents infection of the wound. In 200 cases he has had 45 to 60 per cent. of recoveries.

The amount of powder employed varied with the case and the age of the patient. He has used a drachm of the mixture without seeing any serious results, and has employed suppositories and balls of the mixture in cocoa-butter in sinuses and cavities without seeing any harmful results.

Stone in the Bladder.—KEEGAN (*The Lancet*, January 30, 1897), in a table compiled from the Official Medical Reports published in India, shows that the mortality in 10,073 litholapaxies was 3.96 per cent.; in 7201 lateral lithotomies, 11.02 per cent.; and in 147 suprapubic lithotomies, 42.17 per cent.

The great decrease in the mortality after litholapaxy he attributes to an increasing skill in manipulation, citing the following series of cases as proof: In the first series there were 286 operations in males between fifteen and fifty years of age, with 11 deaths, a death-rate of 3.84 per cent.; 7 out of the 11 deaths occurred in the first 52 cases, or a death-rate of 13.4 per cent.; while

in the remaining 234 cases the mortality was only 1.7 per cent. In a similar manner, in a second series of another operator, of 676 operations in adult males, the mortality was 32 per cent.; in his first 111 operations his mortality was 14.4 per cent., while in the later 565 operations the percentage of mortality was 1.06 per cent. In still another series of 350 cases the mortality was 3 per cent. in the first 50 cases and only 1 per cent. in the last 300. These series of cases by eminent surgeons in India show that not until a surgeon has performed between 50 and 100 litholapaxies does his skill become so perfected that his best results are attained, and he would attribute the low mortality from litholapaxy in India not to a peculiarity of the Indian constitution, which enables them better to withstand the shock of operations, but to the greater proficiency in operating which the great number of cases afford the surgeon there; for even these surgeons, with the same class of patients, had a higher mortality in the first operations which they performed.

The author ascribes the falling off in the number of suprapubic lithotomies to the greater proficiency attained in litholapaxy and the power to crush large stones which the new lithotrites now have. He further advocates the perineal litholapaxy for stones that cannot be crushed by instruments passed *per urethram*. This operation is in general use in India and is giving very satisfactory results, as the injury to the prostate and contiguous structures is much less than where the stone is forcibly withdrawn through a larger incision.

The Disinfection of the Hands.—After a critical study of the literature on this subject and an exhaustive series of carefully conducted experiments, FÜRBINGER and FREYHAN (*Deutsche med. Woch.*, February 4, 1897) conclude that the consensus of opinion and evidence shows that it is practically impossible to sterilize absolutely the hands with soap and water even in conjunction with ordinary antiseptics, but that sterilization is more nearly approached, *cæteris paribus*, the more alcohol is employed in the process.

The procedure advocated is the washing with warm water, soap, and brush for five minutes, rinsing in sterilized water, washing in alcohol for five minutes, washing in sterilized water, with or without a further washing in an ordinary antiseptic solution.

The action of the alcohol their experiments show to be threefold: 1. Its bactericidal action. 2. Through its properties of dissolving fats and mixing with water it prepares a way, not only for its own germicidal action, but also for that of any subsequent antiseptic. 3. It loosens the epidermis and with it the dirt and contained bacteria, washing them away.

Splenopexy.—GREIFFENHAGEN (*Cent. für Chir.*, February 6, 1897) reports an interesting case which came to him with the history of a double nephrorrhaphy. Numerous silkworm-gut sutures were removed from the still ununited wounds, and upon the left side the author found a tumor which he diagnosticated as the pole of a floating kidney which had not been securely fastened in the former operation. The patient was caused much pain and discomfort by the presence and pressure exerted by this movable tumor, and he determined to operate again and fix the kidney in its proper position.

The depth of the wound did not, however, disclose the kidney, which a

digital examination showed to be fast, but in a position lower down than normal, while the floating tumor was found to be the spleen. The author determined to attempt to fix this in position by suture. Two long, stout silk sutures were passed through the parietal margins of the wound, through the peritoneum, and then deeply through the parenchyma of the spleen. Round curved needles were employed, and the bleeding, which in this case was not serious, was controlled by pressure. The peritoneal wound was then sutured and a final stitch passed between the former ones through the spleen; the parietal wound was then closed by deep sutures.

There was no suppuration; the wound healed kindly, with the exception of the discharge of one suture, which had cut its way through the parenchyma of the spleen. The patient recovered completely, the spleen retaining its normal position.

Intestinal Anastomosis by Suture.—The prevalence of the use of plates or buttons for the performance of anastomosis in intestinal operations makes prominent the results obtained by TAYLOR (*Birmingham Medical Review*, February, 1897) in two cases which he reports, where a double row of glover's sutures were employed in the performance of a lateral posterior gastro-enterostomy and an end-to-end intestinal anastomosis.

The intestinal anastomosis was performed for a tubercular tubular growth to the cæcum, which involved the entire coat and circumference of the bowel and caused stenosis, with recurring symptoms of intestinal obstruction and some of recurrent appendicitis. The entire growth was excised and the dilated ileum united to the lower proximal end of the ascending colon. The recovery was complete, with no sign as yet of returning tubercular disease.

The posterior gastroenterostomy was performed for pyloric stenosis in a case in which digital dilatation had been previously employed with a relief of symptoms extending over two years. The posterior opening was employed to prevent the accumulation of undigested food in the dilated stomach and give free exit to the food.

The method of operation was that described by Doyen, and consisted of a continuous glover's suture, which embraced all the coats of the intestine, the mucous the least, and united the cut margins of each wound to that of the other, forming a continuous mucous canal free from the scar-tissue which results after the sloughing out of a button and which occasionally gives rise to cicatricial contraction and stenosis. After the approximation of the edges of the wound by the first glover's suture, a second suture united the serous surfaces at a little distance from the wound.

The author believes that although the Murphy button and other similar means are useful in emergency cases, better results can be obtained in an operation *au froid* by the use of the suture, which he inserts with a round curved needle with no cutting-edge.

A Modification of the McBurney Incision for Appendectomy.—ELLIOT (*Boston Medical and Surgical Journal*, October 29, 1896) says there is no room for doubt that many dangerous and fatal operations for acute appendicitis can be avoided by the timely removal of an appendix which has shown symptoms of disease.

In recommending this operation, not only should the immediate mortality be considered, but all possible complications dependent thereon must be kept in view. The greater frequency of hernia after operations during acute attacks would be an additional reason for doing the operation between the attacks.

The author suggests the following modification of the McBurney incision, believing that it makes the danger of hernia much less.

He has done the operation by the McBurney incision ten times, and has been much pleased with it. When the appendix is in the normal position and is not difficult to get out, it is almost an ideal operation; but when difficulties arise and the incision has to be enlarged, it has certain serious objections. The first objection is that in difficult cases the necessarily constant and hard retraction of the muscles is apt to injure the tissue of the wound-surface so as to make its healing less perfect, and sometimes to cause suppuration. Another objection is that if it is necessary to enlarge the wound, not only is the advantage of the original McBurney incision lost, but we have a ragged and complicated wound with two muscular layers stripped widely apart. Such a wound is not well adapted to drainage if pus is unexpectedly found.

To meet these objections the author begins the operation by a longitudinal cut through the skin and the aponeurosis of the external oblique, beginning one-half inch inside the anterior superior spine of the ilium, and extending to the linea semilunaris. The fibres of the external oblique are thus cut across, but the fibres of the internal oblique and transversalis are separated as in the McBurney operation. In the author's operation the whole incision is a cross-cut, the external and internal incisions running in the same direction. There is no stripping of the external oblique. This incision can be readily enlarged upward or downward in the linea semilunaris, or may be extended into the rectus if necessary. He closes the wound by passing two rows of sutures through all the layers of the abdomen, to prevent a dead space, and unites the cut edges of the external oblique with a continuous buried silk suture.

Nine cases operated upon in this manner have given very satisfactory results; no nerves or muscles are cut, and there is no resulting anæsthesia of the skin. The aponeurosis of the external oblique has united well in every case, and the author sees no objection to cutting it.

Perforated Gastric Ulcer Treated by Operation.—BAKER (*Lancet*, December 5, 1896) gives an interesting detailed report of seven cases of operation for perforated gastric ulcer, with three recoveries. There was nothing particularly noteworthy in regard to the exciting cause of the perforation, but it was noted that those who had partaken of heavy meals just before the attack died, while those who had eaten but lightly recovered. In all cases the perforation was on the anterior wall of the stomach, the largest was only one-half inch across.

The operation was the same in all cases, a median incision above the umbilicus, with a transverse incision through the left rectus in three cases. In cleansing the peritoneal cavity dry sponges were used, the author believing that this method is in these cases much more rapid and better borne

by the patients than a long-continued flushing with the patient already in a collapsed condition. Particular care was used to carry the sponge between the liver and diaphragm, in order to wipe away lymph, fluid, and food, and to prevent the formation of a subphrenic abscess. The anterior wound was drained with strands of iodoform-gauze, one strand reaching deeply between the liver and the diaphragm on each side, another to the suture in the stomach, and a fourth down behind the gall-bladder. They remained *in situ* till the fifth or sixth day, when there was always some difficulty in removing them. The author believes them to be of great value, and thinks they do not interfere with the rapidity of the healing. In no case was the ulcer cut out. The edges were simply folded well in and the closing silk-stitches were deeply inserted in one or two rows by means of round sewing-needles.

In the after-treatment great reliance was placed on feeding by the mouth. Small, repeated doses of egg-albumin and water, beef-tea, of brandy and chicken-broth, were begun as soon as the patient had recovered from the anæsthetic. But besides this, peptonized suppositories were introduced into the rectum, alternating every two hours with five ounces of hot water.

The author believes that success or failure in these cases depends on the moment at which operation is undertaken after the perforation, and whether the stomach is filled with light liquid or solid contents and what has escaped through the perforation.

In the worst case, with much distention and shock, the condition of the patient began to improve after the incision and the escape of gas and fluid from the abdomen. This would lead the author to operate without waiting for recovery from the shock, and with the expectation that operative interference would tend to relieve it. He also notes that handling of the stomach is liable to produce violent vomiting.

The immediate after-feeding, the author believes, is not dangerous, as the stitches should not cut through for some days. The patient should be kept in bed after the operation and treated for gastric ulcer, and the general vicious condition of the digestion cured.

Massage and Movements in the Treatment of Fractures.—After an interesting discussion of this subject, DAVIS (*Annals of Surgery*, December, 1896) summarizes his views as follows:

"It is my belief that massage and passive motion are not used to the extent that they should be in the treatment of fractures; that immobility of the fractured ends favors quick union with little deformity; that there are some cases in which, owing either to peculiarities of the fracture or the impaired constitution of the individual, the tendency to the formation of callus is marked. Motion in these tends to the formation of exuberant callus and deformity. There are others in which bony union is unduly delayed; disturbance of the fractured ends in these hinders union. It is wise to wait until the fractured parts are glued together, usually eight or ten days, before attempting any except the lightest massage, and any extensive passive motion after that time should be used carefully but diligently. Passive motion and massage, when first attempted, should be of the most gentle character, and not so violent as to disturb the relation of the broken bones. Any marked pain and inflammatory reaction following passive motion and massage are

evidence that they have been too violent. The limb should receive massage and manipulation at each inspection or change of dressing, often daily. In some cases it is advisable to administer such massage as is possible without removing the splints. Persistent stiffness, particularly in fractures or injuries of the wrist, is often due to a rheumatoid affection locating itself in the injured region. Massage is valuable in the treatment of such, and should be given to that part of a limb beyond the seat of fracture to preserve it in a normal condition. Such dressings and methods of treatment should be adopted as will allow of the greatest use of massage, and passive and active movements consistent with proper retention of the fragments."

Osteoplastic Filling of Bone-defects.—AF SCHULTEN (*Arch. für klin. Chir.*, Band 52, Heft 1, 1896) reviews the different methods which have been heretofore employed in the treatment of bone-defects after sequestrotomy and losses of bone-tissue in the long bones. The ends to be obtained in these cases he enumerates as follows: (*a*) The form and body of the bone, and at the same time its strength, are to be maintained as near the normal as possible, while the defect is to be either filled up or evened over. (*b*) The wound and skin-margins are to be so nearly brought together that only a slight scar remains after the healing. (*c*) The operation of itself should not be so serious as to make the patient incur a great risk.

The author employs the following method to produce these results: after the sequestrum has been removed and the bone rendered free from all necrotic tissues, the lateral walls are cut free from the rest of the bone without destroying their attachment to the periosteum; then a sufficient amount of the remaining bone is removed on either side of the middle and posterior portion to provide periosteum which will enable the lateral walls to be brought together in the median line and united by sutures, and yet leave sufficient periosteum to cover the entire bone, with only one line of sutures. The same end is obtained by other osteoplastic modes of operating; for instance, only a portion of the lateral wall is preserved, the upper half being resected and left in contact with the periosteum, while the lower half is removed subperiosteally, and thus supplies the periosteum necessary to enable the upper portions of the lateral walls to unite in the median line and fill out the deficiency.

Near the epiphyseal lines the bones may be cut in wedge-shaped sections and slid toward each other to fill up a bone-defect in the middle third of the shaft. The osteoperiosteal flaps may be formed from one or both lateral walls as the individual case demands. The portions of bone are united together by metallic sutures or by strong silk, when the necessary tension is not too great. Care is needed in drilling the holes through the bone, and the author recommends for this purpose the use of the dental engine and drills.

The author never performs the osteoplastic operation on the same day on which he does the sequestrotomy, as he believes that great care must be taken to maintain the patient's strength, as these operations may become dangerous to the patient's life if due caution is not exercised.

The dressings used in such operations must not be compressive, as they retard the circulation and lessen the vitality and power to react and grow in the bones. After an operation in the tibia, for instance, he employs an occlusive dressing, but not compressive. The pads are laid above and below the

wound to support the splint; over the wound-area a sterilized wire gauze is placed, supported by the pads at either end to prevent pressure, and made occlusive by covering it outside with sterilized gauze. Hæmostasis is not secured by compressing-dressings and tight bandages, but before the dressing is put on the limb is elevated and moderate pressure made with gauze tampons, which suffice, after a short time, to still the bleeding. The elevated position is then continued for several days. The wound is dressed but once or twice for the removal of the stitches. The absence of pressure relieves the patient from pain, while the absence of dressing in immediate contact with the wound makes the dressing easy and free from pain to the patient. This dressing has also the advantage, as in many other dressings of this form, that while preventing irritation of the wound by the entrance of extraneous matter, it also prevents the irritation which arises from the contact of the dressings with the wound.

OPHTHALMOLOGY.

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Eucaine in Ophthalmic Practice.—BEST (Giessen) found that a 4 per cent. solution of the hydrochlorate of eucaine is to be preferred for anæsthetizing the cornea. At least four drops are necessary. The solution can be sterilized without decomposition, and may be kept sterile by the addition of formol. Burning pain follows the instillation of even weak solutions (1 per cent.), especially if corneal inflammation exists, and each fresh drop is painful, though to a less degree. There is decided congestion produced, both conjunctival and ciliary. The pupils of both eyes contract for several minutes (reflexly from the sensory irritation). The conjunctiva is not so sensitive as the cornea; it is only after the solution has reached the latter that the severe burning is experienced, for relief of which cocaine has to be employed. These unpleasant effects are, however, not so pronounced in all cases. The anæsthesia is pretty complete, though to a less degree than that produced by cocaine in like strength, and it occurs somewhat earlier (after about six minutes) and is of shorter duration (fifteen to twenty minutes).

Widening of the commissure and dilatation of the pupil are absent; but this is true to a certain degree only, so far as the pupil is concerned. While the usual quantity does not affect the pupil, larger amounts (ten to twelve

drops of a 4 per cent. solution) cause dilatation of 1 to 2 mm. in man. Animals of different species exhibit remarkable differences as regards the action of the drug upon the pupil. Dogs resemble men; rabbits showed only ½ to 1 mm. of dilatation; while guinea-pigs react to eucaine as to cocaine in this respect. The accommodation is not affected. Eucaine, like cocaine, causes opacity of the superficial layers of the cornea. Like cocaine, it diminishes tension slightly. An increased rate of diffusion from the conjunctival sac into the anterior chamber is caused by both—*e.g.*, the effects of pilocarpine or atropine occur earlier and last longer in eucanized eyes. Attention is called to a number of points of analogy between the effects of section of the trigeminus (permanent anæsthesia) and those after local anæsthetics (temporary anæsthesia).

Best concludes that while eucaine might be preferred in certain operations where dilatation of the pupil or ischæmia of the vessels is not desired, it will not displace cocaine on account of the pain it causes.—*Deutsche med. Wochenschrift*, vol. xxii. No. 36.

Rupture of the Iris from Contusion of the Eyeball.—GEORGE C. HARLAN (Philadelphia) finds that separation of the iris from its ciliary attachment, as the result of a blow upon the eye, is comparatively frequent, rupture of its pupillary border much more rare; rupture in the continuity of the membrane is rarest still, and he has not found record of a case of the radiating form of the latter. He reports six instances of pupillary rupture and two of radiating rupture in the continuity of the iris.

In the cases of rupture in continuity the edges of the small radial slits parallel to the iris-fibres tend to approximate, which makes them much more difficult to detect. They can be seen only by transmitted light; oblique illumination does not discover them.

As would be expected from the nature of the accident, when the iris is ruptured by contusion the eye usually suffers some other injury, such as more or less extensive intraocular hemorrhage, injury or dislocation of the lens, or, most frequently, rupture of the choroid.

In the five cases remaining under observation from four weeks to three years after the injury the mydriasis was permanent.

In two cases the accommodation was the same as in the sound eye, and in two it was only partially suspended. In the others it was not practicable to estimate it.

It is probable that ruptures of the iris from contusion, particularly small multiple ruptures of the sphincter, are much more common than is usually supposed. No doubt they have been the cause of the mydriasis in many cases that have been looked upon as paralytic. Harlan believes, however, that the paralytic form does occur as a result of contusion—a kind of peripheral stunning of the nerve-fibres which affects the accommodation equally with the pupil. These cases, however, yield quickly to the action of eserine, and would probably end in recovery in a little longer time without medication.—*Trans. Amer. Ophthalmol. Society*, 1896, p. 640.

Migrating Foreign Bodies within the Eye.—DE WECKER (Paris) reports two instances of the migration of foreign bodies from the deeper parts of the

eye into the anterior chamber. In the first case—a piece of copper—ten months had elapsed since its entrance; in the second—a chip of iron—six years. In the first case, during two attempts at extraction, the foreign body escaped into the posterior chamber, its probable original location, to reappear in a few days at the angle of the anterior chamber. The third attempt at extraction was successful, the reporter believes, because the cornea was opened at a point not, as had been done in the previous attempts, adjacent to the foreign body, but at a considerable distance from this, at the outer half of the horizontal diameter.

De Wecker concludes that a foreign body lodged in the deeper portions of the eye and causing no symptoms may make its way into the anterior chamber by migration, aided by the lymph-current, and a movement impressed upon it by its envelope of leucocytes, and upon its arrival there may set up severe symptoms. He quotes a case reported by Denig, who observed a piece of copper migrate from a point in the retina near the macula, where it had lodged over four years previously, forward and out of the eye through the cornea. The lens in this case had been removed shortly after the accident, having been penetrated and become cataractous.—*Le Progrès Méd.*, 3d series, No. 36.

The Diagnosis of Chalazion.—PANAS (Paris) calls attention to certain errors which may be made in the diagnosis of chalazion when accompanied by acute symptoms. It is to be differentiated from indurated chancre, hordeolum, and, if situated upon the upper lid, from inflammation of the palpebral portion of the lachrymal gland.

At the commissure, where the tumor reaches only a small size and is liable to be accompanied by swelling of the lids and chemosis, it may be mistaken for tenonitis. The chronic form is to be differentiated from gumma, tuberculosis, etc., of a Meibomian gland.—*Presse Méd.*, iv. ann., No. 104.

The Retinal Blood-stream at Death.—C. H. USHER (Aberdeen) reports a series of observations on the retinal circulation at the moment of death in man and the lower animals. The first change, noticeable from a few seconds to one or two minutes after the cessation of respiration, was that the blood-stream became granular in appearance and its flow visible. In the veins this flow continued in the normal direction from the disk; but in the arteries it later, in some cases, returned toward the disk. Afterward the blood-column became narrow, beaded, and broken up in the veins, and the arteries became empty. The granular appearance is probably due to a slowing of the circulation to such an extent as to allow red blood-corpuscles to become visible; and the narrowing of the veins and emptying of the arteries—the latter by return of the blood toward the heart—are the results of the intraocular tension.—*Ophthalmic Review*, December, 1896.

A New Method of Mounting Ophthalmic Specimens.—PRIESTLEY SMITH (Birmingham, Eng.), whose method of mounting in glycerin-jelly has been widely followed, points out that the use of glycerin-jelly as a means of mounting ophthalmic specimens has certain drawbacks. The steps by which the tissues are gradually impregnated with glycerin, in order to avoid shrinking,

are rather troublesome; the glycerin considerably lessens the sharp definition of the tissues by rendering them transparent, and the specimen when mounted is no longer available for microscopic sections, should such be desired. Moreover, it is by no means easy to obtain a perfectly transparent, colorless, and permanent jelly.

Formalin solution, which has proved such an excellent hardening agent, is also a good preservative. If it were possible to mount specimens permanently in this fluid, fixing and displaying them properly in an inverted jar, much time and trouble would be saved. Trials show that this can be done by means of a suitable glass jar, a perforated rubber bung, and a short glass rod which plugs the hole in the latter and holds the specimen in place.

The fluid employed is a 10 per cent. solution of formalin—*i. e.*, one part of "formalin" as sold in the shops to nine parts of water. That which is used for permanently mounting the specimens should be made with water which has been perfectly boiled and cooled, in order that it may contain no air. If this precaution be neglected, air-bubbles will soon make their appearance in the jar.

A jar is completely filled with de-aërated formalin solution; the half-eye is placed in it, the cut surface downward, without inclusion of air-bubbles; the bung, well wetted with the solution to prevent adhesion of air, is pushed firmly in, the fluid welling up though the hole; and, lastly, the hole being completely filled with fluid, the glass rod is pushed in until its inner end presses against the back of the specimen.—*Ophthalmic Review*, 1896, p. 4.

Ocular Manifestations of Gout.—WAGENMANN (Jena), before the Ophthalmological Congress at Heidelberg, called attention to the influence of gout upon the eye. The changes induced by this diathesis may consist in seroplastic inflammations, with or without perceptible excretion of uric acid. As examples he reports cases of scleritis, iridocyclitis with deposits between the choroid and retina, nodules within the sclera, and one typical instance of episcleritis periodica fugax. Moreover, gout may be the indirect cause of ocular affections, especially in consequence of certain vascular changes, particularly precocious atheroma. To this category belong cases of severe relapsing disease of the vitreous humor, which finally leads to cataract, detachment of the retina, and retinitis hemorrhagica. Certain sclerotising affections of the cornea come under the same head. Some cases of glaucoma exhibit a relationship to gout.

In the discussion Nieden agreed with the reader that relapsing opacities of the vitreous are especially characteristic of gout. Pflüger observed relapsing opacities of the vitreous, episcleritis fugax, and glaucoma in gout. Hirschberg witnessed a crystalline deposit in the neighborhood of the macula and also severe relapsing iritis. Alexander called attention to Snellen's observation that the bloodvessels of the eye may become obliterated by deposits of urates. Horstmann noticed ribbon-like opacities of the cornea in eyes otherwise healthy. Such an occurrence is strongly suggestive of a gouty origin.—*Deutsche med. Wochenschrift*, 1896, No. 36.

Treatment of Granular Ophthalmia.—R. H. ELLIOTT (Madras) says: in Madras trachoma is epidemic in certain months, and long after the original

epidemic has subsided the surgeon is still treating the disease. Where prompt and suitable treatment is adopted the majority of cases of trachoma are readily and quickly mastered.

For the condition in which the granules are small, discrete, and easily recognizable he prefers to use the actual cautery. The granules having been exposed by eversion of the lids, each granule in turn is burnt out with the actual cautery. The instrument commonly used is a slender, pointed, steel cautery, readily made or obtained from an instrument-maker. Two, at least, should be available, one being heated by an assistant while the other is in actual use. In operating upon adults cocaine is the best anæsthetic, but for children and very nervous patients chloroform must be used. No pain follows the operation, even in children.

In early cases pannus will disappear when the lid is cured, the yellow-oxide ointment being a valuable auxiliary in the treatment. In later cases, however, the condition is much more obstinate and calls for operation. He has obtained excellent results by free peritomy. In performing this operation care must be taken to remove not only the conjunctiva, but all the subconjunctival tissue right down to the sclerotic. This operation, when thoroughly performed, never fails to give benefit, even in the most obstinate cases. The after-reaction is often alarming, but Elliott has never seen any harmful results follow. Should some amount of pannus still remain after the subsidence of all signs of irritation, the circumcorneal ring of tissue may be carefully destroyed with the actual cautery.—*Indian Medical Gazette*, January, 1897.

The Treatment of Dermoid Tumors of the Orbit.—F. BULLER (Montreal) states that in the books extirpation is the prevailing idea, and that no other plan of treatment is suggested as suitable for all cases.

Total extirpation of small, superficially situated cysts is easy of execution and safe enough, but the larger growths that extend for an unknown depth within and even beyond the proper limits of the orbit may have extensive adherence to the walls of the orbit, to the ocular muscles, and even to the eyeball itself, complications which may entirely prohibit extirpation.

He has introduced a crystal of nitrate of silver as far back as possible into the sac, which was lightly plugged with sterilized gauze and the whole covered with a large pad of gauze soaked in a solution of perchloride of mercury.

Nitrate of silver was used instead of any other irritant because it is a potent antiseptic, self-limiting in its action, and sufficiently powerful to insure complete destruction of the epithelial lining of the cyst, and thus leave the whole surface in a suitable condition for complete adhesion and obliteration of the cavity. He has followed this plan of treatment in a number of cases, and always with perfect success.

Myles Standish (Boston) said, in these cases, he had used iodine on cotton to swab out the sac, packed it with cotton, and removed it on the following day without anything further.—*Trans. Amer. Ophthalmol. Soc.*, 1896, p. 687.

Blindness from Sphenoidal Diseases.—C. R. HOLMES (Cincinnati) points out that the septum of bone separating the sphenoidal sinus from the optic foramen is often extremely thin and sometimes incomplete, and that by extension of existing sphenoidal disease through this thinned wall many

cases of obscure retrobulbar neuritis develop, which may end in blindness. Through this same wall inflammation can extend to the nerves and vessels passing through the sphenoidal fissure, causing neuralgia of the ophthalmic branch of the fifth nerve.

He reports a case in which unrecognized empyema of the left sphenoidal sinus caused intense headache and total loss of sight in the left eye, light-perception being lost. The cavity was opened by a drill, through the anterior nares, and all pain of the eye and head entirely disappeared twelve hours after the operation. Light-perception returned and ultimately ability to read large type and tell time by a watch. On two occasions, the openings becoming obstructed, headache and impairment of vision occurred, which promptly disappeared when drainage was re-established.—*Archives of Ophthalmology*, vol. xxv. p. 460.

The Bandage in Cases of Heterophoria and Squint.—F. W. MARLOW (Syracuse) points out that the onset of convergent strabismus during the wearing of a bandage for injury or disease in childhood, or during any affection which temporarily prevents binocular vision, is not uncommonly observed. A considerable increase in the degree of heterophoria, and more especially an increased interval between the induced double images, are often observed when a bandage has been worn for two or three days after a tenotomy, which, at the time of operation, apparently corrected nearly the whole manifest error. Therefore the annulling of the binocular function by the total exclusion of one eye from vision for a few days would be likely to render manifest any latent heterophoria.

He is also inclined to attribute great importance to the immediate influence of the binocular function in establishing a perfect equilibrium after tenotomy while the tendon is more or less completely detached from the eyeball. This function compels the eye to occupy the position in which single vision is possible, and thereby helps to determine the point at which reattachment of the tendon shall take place. If, on the other hand, the eye is bandaged, it assumes its position of rest; there is no tension or straining of the tendinous fibres induced by the desire for binocular single vision, and the reattachment may take place at a point by no means the most favorable for that purpose.—*Ophthalmic Record*, 1897, p. 117.

OBSTETRICS.

UNDER THE CHARGE OF

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A Study of the Excretions of Parturient Women.—In the *Archiv für Gynäkologie*, 1896, Band lii. Heft 3, NEUMANN reports the results of his study regarding the excretions of parturient women. He first endeavored to

estimate the amount of soluble material voided in the urine by measuring the sulphates which it contains. His conclusions agreed in the main with Winckel's, and showed that the excretion of sulphates is lessened during the first ten days of the puerperal period, being inferior to that usually observed in a healthy adult. The reason for this is found in the fact that such material is voided in the lochia and to some extent by the formation of milk.

Neumann also endeavored to estimate the amount of fecal waste which such patients eject during this time. He found that, like the soluble material, less than normal is passed for the first ten days of the puerperal period. In one instance where the patient failed to have the bowels thoroughly emptied before labor a very great increase above the normal was noted. He calls attention from this to the practical necessity of having the rectum thoroughly empty before parturition begins.

The Prevention and Treatment of Puerperal Fever.—An elaborate and interesting paper under this title has been written by SAFT, one of the staff of the midwives' clinic at Breslau (*Archiv für Gynäkologie*, 1896, Band lii. Heft 3). He describes in detail the preliminary treatment of all patients who come into labor, which consists in thorough external cleansing. During a portion of the year patients are examined by pupil-midwives, whose hands are thoroughly cleansed under the supervision of the house-staff. Great care is taken to sterilize repeatedly nail-brushes and vessels used in cleansing the hands. No vaginal injections either before or after labor are given, except where a patient has been instrumentally delivered and has a foul lochia, when retained material is removed by a copious douche of ½ per cent. lysol. Temperature is measured with great care by introducing a thermometer into the rectum. It is allowed to remain until the mercury ceases to rise, ten or fifteen minutes being often consumed in this observation. When patients have fever no antipyretics are given, nor is local treatment instituted. The diet is carefully ordered, acids and tonics are administered, and alcohol when necessary. This form of treatment has been in use since October 1, 1894. During this time 879 labors have occurred, 512 primiparæ, 367 multiparæ; 94 of these patients required instrumental help, making a percentage of operations of $10\frac{89}{100}$. All of the women normally delivered were discharged sound. Of the instrumental deliveries, one died from infection; one patient was admitted with a ruptured uterus, who did not survive abdominal section. The total mortality was 0.22 per cent. and the septic mortality 0.11 per cent.

The normal limit of puerperal temperature was placed at 38° C., and all cases in which the temperature exceeded this were considered to have fever. Omitting cases of bronchitis, pneumonia, enteritis, mastitis, and phlebitis of the lower extremities, the net morbidity was $24\frac{11}{100}$ per cent. It is noticeable that the morbidity was greater in those patients who were examined internally. The morbidity was least in those who were not examined internally and who had no artificial delivery and no douches. A careful study of those cases who were examined and those who were not examined leads to the conclusion that internal examinations conducted under strictly antiseptic precautions do not increase the mortality-rate of the clinic, although they do produce

more frequent cases of mild fever. On the other hand, high fever was three times as frequent with those who had been examined internally as with those who had not. An examination of the morbidity-rate shows that it was greatly increased by operative interference, and that the highest fever was observed in these cases. Those patients artificially delivered were obliged to remain longest in the hospital; next came those internally examined, but naturally delivered; while the convalescence of those who were neither examined nor operated upon was most speedy of all. The same holds true regarding freedom from permanent bad results.

The case which died of infection was one complicated by gonorrhœa; the pelvis was symmetrically contracted, and it was necessary to deliver the patient by forceps. The patient gradually developed an abscess in the pelvis which ruptured into the abdominal cavity, producing septic peritonitis. The child became infected, and died of sepsis beginning in an inflammation of the middle ear.

As a conclusion from these observations, Saft believes that prophylaxis against puerperal infection should consist in lessening internal examinations as greatly as possible, and in taking the greatest pains as regards antiseptic precautions in obstetric operations. He would entirely omit disinfection of the internal genital organs, even in cases where infection may occur.

In considering the treatment of septic infection, Saft compares temperature-charts from Leopold's clinic, in which active internal disinfection is practised, with charts of cases under his observation in which no local measures were employed, and in which the temperature fell to normal without interference. He is led to conclude that the treatment employed in other clinics is unnecessary, and possibly prolongs the fever. He also finds that in cases of pyosalpinx irrigation of the uterus should be absolutely forbidden because of the danger of infection in the uterine cavity. The same is true of acute inflammations of the tubes and ovaries, and no irrigation of the uterus should be begun without examining the uterine appendages, to determine their condition. From these observations Saft draws the conclusion that ordinary cases in private houses require no internal disinfection nor any internal treatment which exposes the patient to the risk of intrauterine infection.

[In view of the copious and energetic use of antiseptics which, a few years ago, characterized Continental clinics, the statements in the foregoing paper are certainly surprising; we observe that phlebitis of the lower extremity and mastitis are not counted as infectious, and no good reason is given for omitting them. We cannot agree with the writer in absolutely forbidding intrauterine treatment in septic infection; we have seen no harm, but rather decided good, follow the thorough cleansing of the infected uterus, provided this be done early in the case.—Ed.]

Following the preceding paper, in the *Archiv für Gynäkologie*, 1896, Band lii. Heft 3, occurs a communication from Baum, of Breslau, upon "Asepsis and Antisepsis in Obstetric Cases." He draws attention to the great discrepancy between the reports of various clinics, arising from the different methods of measuring temperature. He urges that the thermometer be inserted into the rectum, and that abundant time be given for the mercury to rise. He finds that normal patients who are not disturbed in any way

will at times have fever which never becomes dangerous, but spontaneously disappears. He believes this to be due to the fact that bacteria are always found in the vagina, but that they do not become virulent unless the tissues are extensively altered by either mechanical injury or by extraneous infection. As the most frequent source of injury to the tissues is interference, he would omit this whenever possible. His observations teach him that the hands of the practitioner are seldom thoroughly disinfected; it is easy to see, then, why infection should occur.

As regards the efficiency of different antiseptics, he lays great stress upon the use of alcohol, as bacteriological examination shows that when the hands are cleansed by this agent they are most often completely sterile. He finds, however, that in many cases the temperature rises for a short time above the normal line and spontaneously descends to the normal; this does not indicate infection, as there are many conditions which may cause a rise in the patient's temperature, and which are not septic.

Gastrohysterotomy for Highly Contracted Pelvis.—In the *Annales de Gynécologie*, February, 1897, PINARD and SEGOND report the case of a primipara, aged thirty-two years, who had a highly contracted and asymmetrical pelvis. Symphysiotomy was declined because of the peculiar contour of the pelvis and the condition of the birth-canal; when labor occurred the patient was delivered by abdominal incision, followed by the entire removal of the uterus. The operation lasted an hour. The method of operation consisted in ligating the vessels on one side of the uterus, separating the cervix from the vagina and then closing the vessels on the opposite side; the patient and the child made a good recovery.

Complete Retroflexion of the Pregnant Uterus at Term; Obstructed Labor; Total Abdominal Hysterectomy.—VARNIER and DELBET report a remarkable case of fibroma complicating pregnancy and retroflexion (*Annales de Gynécologie*, February, 1897). The patient had been married for twenty-three years, and had not been pregnant. The form of the tumor was such that a positive diagnosis could not be made. Pregnancy evidently existed, but the position of the child and the shape and size of the uterus were abnormal. On opening the abdomen it was found that the uterus was very strongly retroflexed into the pelvic cavity beneath the sacrum. It was raised with great difficulty, incised, and the child removed, the uterus being then completely extirpated. A curious feature of this case lay in the fact that the patient was entirely ignorant of the presence of the fibroma which blocked the pelvis, and also of the abnormal position of the uterus. She had no symptoms pointing to these conditions.

Etiology of Obstetrical Paralysis.—WALTON (*Boston Medical and Surgical Journal*, 1896, No. 26) has found, in dissecting the brachial plexus of the newborn infant, that the plexus is in close apposition to the sharp, inner edge of the clavicle. The suprascapular nerve leaves the plexus much higher up, passing outward and backward to the suprascapular notch. Walton believes that this nerve is independently stretched in the separation

of the head from the shoulder during birth, the distal point of fixation being the suprascapular notch or the outer edge of the suprascapular spine. It is observed that the muscles supplied below the spines of the scapulæ are most often injured; the rotation of the head, which brings the occiput under the pubes, brings the plexus forward against the clavicle also, shortening the distance from the emerging point of the plexus-roots from the spine and also the suprascapular notch.

So far as statistics are available they bear out what Walton has stated. The paralysis usually affects the arm upon the side opposite to that to which the occiput was directed during labor, in the first position, paralysis of the right arm being most often observed. As regards prophylaxis, Walton suggests that the second stage of labor be made as short as possible.

Uterine Fibroma Complicating Pregnancy, with Total Abdominal Hysterectomy.—In the *Annales de Gynécologie*, February, 1897, MONOD reports the case of a woman, aged thirty-nine years, several months pregnant and having a fibroma of the uterus. It was determined to remove the womb, which was done without special difficulty and a gauze drain left within the vagina. But little difficulty was experienced in the operation, the patient making a good recovery.

GYNECOLOGY.

UNDER THE CHARGE OF

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The Virulence of Pus from Diseased Adnexa.—KIEFER (*Centralblatt für Gynäkologie*, 1896, No. 52) affirms that in all cases of suppuration the life or death of the patient depends upon two factors—the degree of virulence of the pus and the power of resistance of the system. He made a bacteriological examination of pus from forty operative cases, in which recovery followed, in spite of soiling of the peritoneum during removal of the diseased adnexa. He attributes the low grade of virulence in old cases to the fact that encapsulated pus generally loses its infective quality in six months or a year, by overproducing its own toxins, though these may retain their virulent power for a longer period. Massage is therefore to be avoided. Purulent foci communicating with the bowel or vagina retain their virulence much longer.

Echinococcus of the Tubes.—DOLÉRIS (*Indépendance Méd.*, 1896, No. 22) reports the case of a multipara, aged thirty-six years, who had suffered with severe abdominal pain for eleven years. The diagnosis of uterine fibroid was made. On opening the abdomen a tumor was found extending above the umbilicus. It consisted of both Fallopian tubes enormously enlarged

and adherent to one another and to the omentum. They contained numerous echinococcus cysts. There were no metastases. The patient was cured.

The Relation between Menstruation and Erysipelas.—SALVY (*Gaz. hebdom. de Méd. et de Chirurgie*, 1896, No. 40), from a study of 810 cases, found a direct relation between menstruation and erysipelas in only 5.2 per cent. In 1.62 per cent. menstruation could be regarded as a direct etiological factor. In fifty-seven cases of recurrent erysipelas only three were due to menstruation. Erysipelas has no appreciable influence on the duration and amount of the flow. On the contrary, menstruation favors the development of erysipelas through its influence on the nervous system. Recurrences during the flow are due to the peculiar nervous state of the patient and to the persistence of colonies of streptococci in the skin and lymph-spaces, whose virulence has not been entirely destroyed.

The Treatment of Chlorosis with Ovarian Tissue.—SPILLMANN and ETIENNE (*Gaz. méd. de Paris*, 1896, No. 35), reasoning that, aside from their function of ovulation, the ovaries, through the medium of the menstrual blood, are the active agents in causing the excretion of certain organic toxins and also play an important *rôle* in the general nutrition, infer that since chlorosis is a disease of the ovaries, the functions of the latter ought to be restored by the incorporation of ovarian tissue. They administered to six chlorotic females the fresh ovaries of sheep, dried ovarian tissue, and fluid prepared according to Brown-Séquard's method. Unpleasant symptoms were noted at first, such as abdominal pains, headache, and muscular soreness, with sometimes a slight rise of temperature. In three cases the patients were much improved, the paleness disappeared, the number of red corpuscles increased, and menstruation reappeared. The remedy seemed to act like an antitoxin.

Technic of Alexander's Operation.—CALMANN (*Centralblatt für Gynäkologie*, 1897, No. 4) describes the following ingenious procedure: after drawing out the ligament as far as necessary on both sides, it is kept on the stretch by an assistant while two sutures of fine catgut are passed through it and through the pillar of the external ring on either side. Then sutures are passed on both sides through the aponeurosis, then through either half of the ligament parallel with its long axis, and out through the aponeurosis again near the point of entrance. When tied, these unite the ligament firmly to the aponeurosis without constricting the former. Finally the redundant portion of the ligament is excised and the distal end is sutured to the stump of the ligament. The wound in the skin is closed with a continuous catgut suture.

Examinations by the Brandt-Dührssen Method.—ADOLPHI (*St. Petersburger med. Wochenschrift*, 1896, No. 43) speaks highly of this method, which allows one to practise bimanual examination as thoroughly as if the patient were anæsthetized. The essential point is that the thighs should be strongly flexed as the woman lies upon her back, while the examining-finger is introduced under the left thigh, instead of between the thighs. The writer

employs a low couch, the head and foot of which can be raised by means of screws. The patient lies upon her back with her arms extended, her mouth being slightly open. The physician sits on her left side and places his right hand upon the abdomen, while the left forefinger is inserted into the vulva. If the abdominal muscles are not sufficiently relaxed, the patient is drawn downward and the thighs are flexed still more by raising the lower segment of the table. The symphysis and thorax are approximated and the recti are relaxed, thus favoring the most satisfactory practice of the bimanual.

Disturbances following Castration, and their Treatment with Ovarian Tissue.—Lissac (*Gaz. hebdom. de Méd. et de Chirurgie*) reviews the various phenomena noted in women after castration, which are more severe in young, neurotic females than in normal subjects who are near the menopause. These are flushing, psychical symptoms, congestions and hemorrhages, disturbances of nutrition, and modifications of the sexual passion.

Flushing is a phenomenon which presents wide variations in regard to its appearance and severity. In some women it is noted only once a month, at the time when menstruation should occur; in others it may recur every half-hour or hour during the day or night. Sometimes the face alone is affected; sometimes the entire body seems to be congested and is covered with perspiration. The sensation of heat may be felt during sleep, the patient awaking in terror to find herself bathed in sweat. This symptom may persist for ten or fifteen years.

Among the reflex symptoms are headache, insomnia, neuralgia, cardiopathies, and muscular asthenia. Marked changes in the disposition are common, such as irritability, loss of memory, and mental depression, which may persist for many years. Insanity is noted in a certain proportion of cases of castration. Among the congestive phenomena are the irregular uterine hemorrhages and vicarious bleeding from various organs.

Increase in adipose has been generally observed, due to profound disturbance of nutrition of vasomotor origin and probable deficient oxidation. The apparent improvement in health as evidenced by increase in weight is often misleading. Sexual feelings are more or less changed in about one-half of the cases.

The effect of administration of ovarian extract upon women after castration has been to modify, in many instances, the before-mentioned disturbances. In sixteen cases thus treated by Jayle the flushing was more or less relieved, but returned after cessation of the treatment. Crude ovarian tissue and ovarin were given by the mouth, and ovarian liquid was injected hypodermatically. Ovarin was found to be most convenient, though it sometimes caused indigestion.

The first effect noted in the case of highly neurotic subjects was that the insomnia from which they all suffered was relieved. Cephalalgia was generally relieved or cured, and many psychical symptoms were ameliorated, especially mental depression. In one instance marked genital hyperæsthesia was notably relieved.

In four cases uterine hemorrhages ceased under treatment In general, nutrition was improved and the patients expressed themselves as feeling much better. But it must be admitted that the treatment should be continuous.

PÆDIATRICS.

UNDER THE CHARGE OF

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Treatment of Cholera Infantum by Subcutaneous Injections of Serum.—REINACH (*Münchener medicinische Wochenschrift*, 1896, No. 18, p. 421) reports the results of treatment in fifteen cases of grave cholera infantum, in nurslings of from fifteen days to nine months of age, with subcutaneous injections of horse-serum in doses of 10 to 20 cubic centimetres. The effect of these injections, given usually in the evening, has been most remarkable. Collapse disappeared; cyanosis gave place to normal color of the skin; the extremities became warm, the pulse stronger, and the temperature was raised. This improvement, which was noticed ordinarily six to seven hours after the injection, was maintained on the following day; sometimes at the end of twenty-four hours a relapse occurred, but this yielded permanently to a second injection of serum.

In one case the injection caused a passing rise of temperature to 101.3°; in three others there was albuminuria of short duration; in a fifth case, fifteen days after injection, a generalized erythema appeared, lasting two days.

Of the fifteen infants so treated, four died, two of a concomitant bronchopneumonia and two of a follicular enteritis. All other medication was withheld, and, aside from injections, the treatment consisted only of the regular administration of rice-water.

Immunizing-injections of Serum in Diphtheria.—LÖHR (*Jahrbuch f. Kinderheilk.*, Bd. xliii. S. 67) has studied the value of immunizing-injections in hospital upon 254 children of ages varying from two months to fourteen years, the observations covering a period of twenty-one months. The strength of the serums varied from 100 to 3000 units, and the dose from 1 to 10 cubic centimetres.

In the beginning, when the injections were made only upon patients in beds near to those which had been occupied by the diphtheritic patients, four cases of infection occurred. When, however, the injections were made upon all the patients of the ward, and, later, upon all patients subsequently admitted, the disease did not reappear, except in three cases thirty to forty days after injection, twice in children readmitted to the hospital, and once with a child that had been discharged well and returned at the end of a month with an attack of the disease. It is also noted that two children admitted, but not injected on account of the gravity of their condition (pleurisy, articular rheumatism), contracted diphtheria and one of them died.

The three cases of infection developing one month after prophylactic injection induced the author to repeat the injection monthly upon children who remained for any length of time in the hospital. After this plan was adopted no new case of diphtheria developed in the ward.

Another series of immunizing injections was made in the measles ward upon 99 children. Of this number there were twenty-one cases that died, all of them under one year of age; but in no case was there diphtheria or croup. Comparing this with previous statistics—those of Henoch, Rosenthal, and others, tabulated before the employment of prophylactic injections of serum—the relatively large number of deaths from croup or diphtheria (without bacteriological examination, however) is especially significant.

In the scarlatina pavilion, where, in the interval of twenty-one months, eleven cases out of 240 contracted diphtheria, the same results as in the ward were noticed. So long as only those in neighboring beds were immunized, diphtheria broke out from time to time, not to disappear definitely until prophylactic injections were made upon all new patients and repeated monthly upon those remaining in the ward. Of ninety-seven children who received immunizing injections, only one contracted diphtheria, twenty-one days after the last injection. The accidents of prophylactic serotherapy, in this author's experience, have been the same as those observed in cases of diphtheria treated by the serum. In no case were there grave complications, and such as occurred seemed to have no dependence upon the small or large quantity of serum used.

The Etiology of Tetany in Infants.—Romme (*Gazette hebdomadaire de Médecine et de Chirurgie*, January 24, 1897, p. 73) presents a satisfactory review of the status of this interesting question, and, contrary to the claim of Kassowitz and his school that tetany is a manifestation of rhachitism, shows quite conclusively that this theory cannot be accepted. In regard to the three so-called cardinal signs of latent tetany—laryngospasm, Trousseau's sign, and the facialis phenomenon—Romme shows that these symptoms are only evidences of mechanical or reflex hyperexcitability of the cord and peripheral nerves, and the diversity of pathological conditions in which they are encountered indicates sufficiently the diversity of their causes. The absence of a precise etiology should therefore reserve the diagnosis of tetany for cases showing spontaneous characteristic contractions. In this respect tetany resembles epilepsy, the isolated clinical manifestations of which are not pathognomonic, but in their ensemble they give to epilepsy a nosological place. This analogy extends even to the pathological anatomy; the lesions found in tetany are very variable and diverse. Weiss, Bonome and Cervesato, and Szabo found a poliomyelitis of the cervical cord; others, as Tonnelier, Blondeau, Grisolle, and Trousseau, a hyperæmia of the brain and meninges; others, as Stasse, Niemeyer, and Schultz, a peripheral neuritis; while others, like Loos, have found only negative results in their autopsies. For tetany, as is the case for epilepsy, pathological anatomy furnishes no data that can be used in a study of the etiology or clinical course of this affection.

Catalepsy among Rhachitics.—Epstein (*Revue Mensuelle des Maladies de l'Enfance*, January, 1897) reported to the German Society of Naturalists and

Physicians, at their meeting in September, 1896, his observation of cataleptic symptoms in eight rhachitics, aged from eighteen months to three and one-half years. These phenomena were manifested by the persistence of the position given to a limb. If, for example, the leg was raised, it was maintained in this position for a long time, often as long as fifteen to twenty minutes, in one case even as long as forty minutes, and then falling very slowly. If the position of the limb or parts of it was changed, even to a very uncomfortable attitude, the immobility would be maintained for an equal period of time. This phenomenon was more constant and distinct in the leg than in the arm. There was no tremor in the limb; during this cataleptic state the reflex excitability seemed diminished.

All of these children were rhachitic in a high degree. Aside from this condition, coupled with great feebleness, all these children presented a sort of arrest of intellectual development; they could not talk, or talked poorly for their age, and were quiet and apathetic. The general weakness and defective intellectual development in all these children, with a history in some of them of an acute disease (pneumonia), recall the cataleptiform states observed in adults after grave affections like typhoid fever (Bernheim).

Diagnosis between Diphtheritic and Pneumococcic Anginas.—Jaccoud (*Bulletin Médical*, September 13, 1896) believes diagnosis between these two forms of angina to be possible before bacteriological examination can be made. The onset of pneumococcic angina is very violent; in a few hours there are violent chill, severe pain in the throat, swelling of the glands, and a rise of temperature to at least 103° F. Locally, there may be membrane or not; when present, the exudation is grayish-white in color and adherent; when absent, the mucous membrane is red and glazed in appearance. The course of the temperature is characteristic; defervescence occurs suddenly on the fourth day. Albuminuria is sometimes observed, but is slight and of short duration.

In a word, the course is violent but benign, and there are no complications. The treatment is the application of glycerin with bichloride, 1 to 1000, after removal of the membrane, followed by boric-acid washings.

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